# WORK PROGRAMME of EURL for PESTICIDE RESIDUES IN CEREALS AND FEEDING STUFF

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#### INTRODUCTION

The main purpose of the European Union Reference Laboratory on Pesticide Residues in Cereals and Feedingstuff (EURL-CF) is to ensure the quality of the pesticide residue analysis performed on food and feed in the EU Member States (MSs). This includes the use of multi methods as well as harmonized procedures for quality control and validation of methods used. Most of the activities of the EURL-CF aim to implement 1) valid multimethod for analysing pesticide residues in cereals and feeds, 2) improving and boosting the communication in the EURL/NRL/OfL network, 3) strengthen education and training, 4) address knowledge gabs, and 5) ensuring harmonization according to the Commission Implementing Decision EU 2017/660 'concerning a coordinated multiannual control programme of the Union to ensure compliance with maximum residue levels of pesticides and to assess the consumer exposure to pesticide residues in and on food of plant and animal origin' (latest version).

In addition, the EURL-CF will provide assistance to the MSs to reduce knowledge gaps and increase both analytical performance as well as the analytical scope. Furthermore, the EURL-CF is, together with EURL-FV, EURL-SRM, EURL-AO editor of the guidance document SANTE 11945/2015 on Method Validation and Quality Control Procedures for Pesticide Residues Analysis in Food and Feed (latest version).

The EURL-CF is hosted by the Technical University of Denmark, National Food Institute (DTU Food) as part of one of the activities of the Research Group for Analytical Food Chemistry. The Research Group is involved in all aspect of providing chemical data, which is a crucial part of food trust and transparency for healthy choice by consumers as well as for regulation by authorities and innovation by industry. The ambition in the Research Group for Analytical Food Chemistry is to provide and interpret these crucial data by developing and applying reliable, robust and detailed chemical analysis. Our focus is on trace analysis of small organic compounds in food, feed and biological samples. Our core fundament is high performance mass spectrometry coupled to chromatography applying MS-MS, accurate mass spectrometry and isotope ratio measurements. Our object will be reached by challenging state-of-the-art mass spectrometry, data processing and sample preparation. Methods for monitoring and metabolomics combine our efforts to:

- Develop cost-efficient, robust and scalable methods for food monitoring and control that are specific and sensitive as well as of value for the official food control.
- Develop screening methods that are comprehensive to discover emerging risk.
- Maintain a metabolomics platform to unravel biological effects and mechanisms of chemicals.
- Co-develop new analytical technologies and strategies.

The Research group is also involved in authenticity, fraud and quality.

DTU Food supports the EURL-CF with basic housing as well as administrative and IT-support. In 2018 DTU Food will co-finance 22% of the overall budget as part of their responsibility as NRLs on pesticide residues.

#### Regulation (EU) 625/2017 Art 94(2):

European Union reference laboratories designated in accordance with Article 93(1) shall be responsible for the following tasks insofar as they are included in the reference laboratories' annual or multiannual work programmes that have been established in conformity with the objectives and priorities of the relevant work programmes adopted by the Commission in accordance with Article 36 of Regulation (EU) No 652/2014:

(taking into account Art 147 of (EU) 625/2017)



# TO ENSURE AVAILABILITY AND USE OF HIGH QUALITY METHODS AND TO ENSURE HIGH QUALITY PERFORMANCE BY NRLs.

Please, provided activities related to Regulation (EU) 2017/625: (Number of Sub-activity boxes can be adjusted by EURL)

- Art. 94.2.a Providing national reference laboratories with details and guidance on the methods of laboratory analysis, testing or diagnosis, including reference methods.
- Art. 94.2.b Providing reference materials to national reference laboratories
- Art. 94.2.c Coordinating the application by the national reference laboratories and, if
  necessary, by other official laboratories of the methods referred to in point (a), in
  particular, by organising regular inter-laboratory comparative testing or proficiency tests
  and by ensuring appropriate follow-up of such comparative testing or proficiency tests in
  accordance, where available, with internationally accepted protocols, and informing the
  Commission and the Member States of the results and follow-up to the inter-laboratory
  comparative testing or proficiency tests.
- Art. 94.2.1 Where relevant for their area of competence, cooperate among themselves and with the Commission, as appropriate, to develop methods of analysis, testing or diagnosis of high standards.

Sub-activity 1.01 Provide NRLs with details and guidance on the methods of laboratory analysis

Objectives: Provide information to NRLs concerning method, PTs and general knowledge sharing. Description:

1.01.1 Updating the EU RL website and the Circa domain



Maintenance of the common web portal http://www.eurl-pesticides.eu for the pesticide EURLs (horizontal task – see description in AWP for EURL-SRM).

The communication platform supports the coordination activities of the EURLs and serves as contact, reference and service points for the National Reference laboratories and official pesticide residue laboratories in Europe. The website for Cereal and Feeding stuff will be maintained in coordination with the other EURLs and the following items will be updated: Presentation of the EURL, information on proficiency test, training courses, workshop, annual work programme, validation data and analytical methods. The website is accessible for everybody. Additional also input to the development of the Datapool, especially the EUPT-Archive

Maintenance of the common CIRCA database (horizontal task – see AWP for EURL-AO). The CIRCA database is only accessible for a limited number of persons, mainly persons employed in NRLs or OfLs. Consequently, information can be uploaded to this platform if it has a more confidential content. It could e.g. be data that could be published in scientific papers. However, the platform can also send emails when new documents are uploaded. Therefore, information put on the open web portal will also be uploaded to the CIRCA platform.

#### 1.01.2 Updating the EURL data pool

Validation results will be up loaded to the data pool and list of NRLs and OfL will maintain in cooperation with the EURL-SRM.

Expected Output: New webpages created or webpages updated

Duration: On-going

#### Sub-activity 1.02 Organisation of proficiency tests and follow-up on the results

Objectives: Checking the analytical performance of the NRLs and OfL contributing to the EU monitoring programme.

Description:

#### 1.02.1 Organisation of EUPT-CF12 on hay

The proficiency test will cover pesticides analysed by multi methods. The target pesticides will include 179 pesticides, as agreed on by the Advisory Group. The hay, which will be used as test item, was produced by a consultant in 2017. After reception of the hay, it will be homogenized and portions will weighed out into screw-capped polyethylene plastic bottles, sealed, numbered, and stored in a freezer at about -20 °C prior to homogeneity and stability testing. Before shipment of the test items, 20 homogeneity experiments will be performed (double determinations of 10 randomly selected test items). Stability test will be performed on several occasions during the PT period, in total 50 experiments.

It is foreseen that around 100 EU NRLs and EU OfLs will participate in the PT and additionally 10-20 official laboratories from Third Countries. On meeting with the Scientific Group are foreseen. The meeting will probably be held in Spain.

#### 1.02.2 Preparation of test items for proficiency test 2019, EUPT-CF13

If necessary, field spraying of a relevant cereal or feed crop will be performed by a consultant in order to produce test material for EUPT-CF13. The proficiency test will focus on crops agreed upon by the Advisory Group. The NRLs will be involved as well in the selection of test item, during the 2018 workshop.



#### 1.02.3. EUPT result submission website and tools

The database and web tool for the four annual proficiency tests (PTs) organised by the four pesticide residue EURLs will be updated. Before the database is opened for submission of test results the web pages and data forms must be edited. A list of the pesticides in the PT in question is loaded into the database. In the main database table a row for each participant and each pesticide in the test is inserted (150 participants and 150 pesticides makes 22500 rows in the database table). The main webpage and subpages are changed to fit the individual PT. The forms for result submission must be edited (PT name, test item name, the list of target pesticides, method information needed). Forms and reports must be prepared for the organizing EURL, so they can supervise the data submission. Before the link to the webpage is activated, the system is tested and a guide on how to enter results and information is prepared.

#### Maintenance during the PT:

When the PT is running the result submission is supervised to be able to correct any errors that might occur. After deadline for result submission, links to the web-pages must be de-activated and data must be extracted from the database for statistical processing.

Expected Output: Draft report, final report, certificates to the participants and 20-50 kg Test Item with incurred pesticide residues and 20-50 kg of Test Item without pesticide residues.

**Duration: On-going** 

7% financed by DTU (includes only use of instruments)

#### Sub-activity 1.03 Method development employing Accurate Mass Spectrometry

Objectives: Increasing method performance of screening method using Accurate Mass Spectrometry Description:

## 1.03.1 Building a database with exact masses of pesticide fragments for use in screening methods on GC-QTOF-MS

GC-Q-TOF-MS is an accurate GC-MS/MS technique that is based on high resolution time-of-flight mass spectrometry. As mentioned above, the accurate mass provides a significant improvement in identification of pesticides and can therefore be a valuable tool for confirmation of positive detections by other common MS techniques. However, unlike in LC-MS, compounds analysed by GC-MS are commonly fragmented in the ion source and the molecular ion is rarely detected or only detected in low abundance. Using GC-QTOF-MS it is therefore necessary to use the fragments for identification and therefore also to assign the correct exact mass for all relevant fragments. These data are currently not available in standard libraries. In 2014 the EURL-FV and EURL-CF started to calculate exact masses for pesticide fragments in order to build a database for EI ionisation. In 2015 EURL-CF updated the database with 53 new pesticides and their fragments. In 2016 and 2017 the database was in corporation with EURL-FV be continuously updated with 50 more pesticides and their fragments. In 2018 exact masses of additional 30 pesticides and fragments obtained by EI ionisation will be added. Furthermore, exact masses of 30 pesticides and fragments obtained by CI ionisation will added to the database. The focus for EURL-CF will still be on pesticides not included in MACP.

## 1.03.2 Development and validation of Accurate Mass Spectrometry screening methods for analysis of cereals

The EURL has developed and validated a screening method for pesticides in cereals by LC-QTOF-MS and GC-QTOF-MS during 2012-2017. The method is based on QuEChERS extraction and clean-up, and is to day validated for around 500 pesticides during 2012-2017.

The work in 2018 will focus improving the performance of both the LC- and GC-QTOF-MS screening methods. This will be obtained by preparing single standard solutions of all pesticide standards available in the laboratory (approximately 700 compounds). Using these single standards mass spectra, relatively clear of interferences, can be obtained and implemented into the software allowing for more compounds to be implemented in the screening methods. Analysing the 700 standard will also allow the determination of the retention times for the compounds both absolute and relative to a set of marker compounds which in future will allow for more precise correction retention times and thereby also more reliable identification of pesticide residues.

## 1.03.3 Development of a method for quantification of pesticides from marker compounds using Accurate Mass Spectrometry

There is a large demand and wish for including more and more target compounds in the pesticide residue control. However, larger analytical scope also means need for purchasing and handling a larger number of analytical standard in the laboratory. Some analytical standards are generally relatively costly, especially the metabolites and not all of them are currently commercially available which makes it impossible to control for pesticide residues where these metabolites are included in the residue definition. Furthermore, it is time consuming to maintain a standard stock solution collection >400 compounds according to the quality assurance system described in SANTE/11813/2017. The fact that a large part of them are seldom found may be used as an argument by some laboratories that the benefit compared to cost is not high enough. Thus, some laboratories hesitate to widen their analytical scope due to limited financial and/or time resources.

HRMS screening data allow for retrospective data analysis, i.e. to look for compounds not originally included in the scope. However, such retrospective findings are not possible to quantify since the relevant standard was not analysed together with the sample at that time. However, it may be possible to semi-quantify the content if a number of marker compounds had been added and the analytical responses of these were recorded. By comparing the responses from the marker compounds with the response from a standard of the compound of interest, analysed in a new analytical run using the same method, a quantitative result can be estimated.

The aim of this task is to develop a model that will allow quantification of pesticides and metabolites (based on the response of another marker compound). This approach may be relevant to use if when standards are not available or outside the reach of the laboratories as they are too expensive to purchase, and for quantification of findings identified by retrospective data analysis. The work will be a continuation of the initial work done in 2017 where a limited number of pesticides and developed and tested using pesticide metabolites that are commercially available.

Expected Output: Report uploaded to CIRCA platform

Duration: 2018-2020

22% financed by DTU (staff and consumables)

#### Sub-activity 1.04 Studies on possibilities to include pesticides in multimethod for cereals/feeds

Objectives: Studies on possibilities to include pesticides in multimethod and gaining knowledge of achievable LOQs

Description: Inclusion of more pesticides in the quantitative LC-MS/MS and GC-MS/MS methods is a constant request. New pesticides are authorised for use in EU, the number of pesticides included in the MACP are generally expanded, the pesticides relevant in regard to Regulation 669/2009 is



changing etc. Furthermore, EFSA is in need of lower LOQs to refine their intake calculations and this will be possible due to more sensitive GC-MSMS and LC-MSMS instruments. Consequently, the work on optimising the multimethod for cereals and feeds will therefore be continued.

#### 1.04.1 Study on the possibility to include new pesticides/metabolites in multimethod for cereals

The study will be performed by using the QuEChERS for additional 20 pesticides. The pesticides chosen will mainly be from the EFSA Progress report MRL review (10/06/2013), MACP, the working document and new authorisations. The final decision on which pesticides to include will be based on last minute information on the most relevant pesticides to cover. However, the following pesticides would be of interest: 2,5-Dichlorobenzoic acid methylester, aclonifen, cletodim, cyantraniliprole, dazomet, denathonium benzoate, etrimfos, fipronil sulfon, flupyrsulfuron-methyl, flurochloridone, formetanate, isofetamid, methylisothiocyanate, oxathiapiprolin, prohexadione, sintofen, and valifenalate. The study will additional enable the EURL to contribute to the Art. 12 process by establishing LOQ for the pesticides in question. The study will include minimum three cereal matrices and be spiked at concentration level at ≥0.005 mg/kg. The validation data will be generated, converted in the specific format and uploaded to the common database. This information is important for EFSA and the official laboratories.

#### 1.04.2 Study to gain knowledge on the possibility lower LOQs on cereals to 0.005 mg/kg

The study will be performed by using the QuEChERS. The 340 pesticides already validated to ≥0.01 mg/kg or higher, will be sought validated down to 0.005 mg/kg. The study will be performed on 3 different cereals matrices. The study will additional enable the EURL to contribute to the Art. 12 process by establishing lower LOQs for the pesticides in question. The data will be generated, converted in the specific format and uploaded to the common database. This information is important for EFSA and the official laboratories.

#### 1.04.3 Study on the possibility to include the feed matrix hay as a commodity in multimethod

The study will be performed by using the QuEChERS method and covering >350 pesticides. The pesticides included will be from the list of pesticides already validated for cereals and the spike will be performed at concentration level at 3 levels ≥0.025 mg/kg. Hay is a difficult dry matrix that swells al lot when water is added. Consequently, only one gram of sample is analysed (in contrary to the 5 g sample for cereals analysis). However, the pesticides are applied as direct foliar application to the grass and high levels of pesticide residues are typically found. Thus LOQs at 0.025 or 0.05 mg/kg are considered to be sufficient.

Expected Output: Three reports and updates of the datapool.

Duration: 2018

30% financed by DTU (staff, consumables and capital equipment)

#### Sub-activity 1.05 Development of method for analysis of residues of co-formulants

Objectives: Gain knowledge on occurrence of residues of co-formulants in food and feed Description:

Following the manufacture of a pesticide technical material (active ingredient, a.i.) the manufacturer must prepare a formulation to ensure that it can be used in a safe and efficacious manner. To obtain this the a.i. is mixed with other ingredients (additives/adjuvants/co-formulants). Such ingredients may be solvents, mineral clays, stickers, wetting agents etc. There has been an increasing interest in the role of these co-formulants in some biological effects observed in humans and animal consuming food or feed with pesticide residues.



However, presently there are no data available on the occurrence of such co-formulants on/in food or feed. With the present study we will therefore initiate the development of an analytical method for the detection of some commonly used co-formulants. With the developed method it will be studied whether application of PPP in the field will leave detectable residue of the relevant co-formulants in hay and cereal test materials for which it is known which formulations have been applied

Expected Output: Analytical method for selected co-formulants

Duration: 2018-2020

34% financed by DTU (staff, consumables and capital equipment)

#### Sub-activity 1.06 Processing factors for bread

Objectives: Gain knowledge on the effects of processes as e.g. rising and baking, on the levels of pesticide residues in cereal products

Description: Bran, mainly from wheat, is widely used in the manufacture of various foods such as bread and breakfast cereals. MRLs are fixed for the whole grains inclusive the bran parts. Because pesticide residue are commonly not evenly distributed in the grain processing factors are necessary for carrying out the risk assessment of bran product that is either used directly or added to products to increase the fibre content. In a previous study we have studied the distribution of a number of incurred pesticides between the bran and the remaining part of the kernels. From this study processing factor for milling of grain to white flour and bran was calculated. The material used was left over from cereal kernels originally produced as PT reference materials. Available after this study is now bran with relatively high residues of a number of incurred pesticides

The human consumption of bran is primarily accounted for by cereal based products that after milling have been further processed to e.g. bread and bisquits. The pesticide residues occurring in the bran may be affected by these processes and processing factor covering these are therefore also necessary for a refined dietary intake and risk estimation. The bran with incurred pesticides available will in the present study be used as a model for various cereal based products with high bran content. The effect of processes occurring during e.g. rising and baking, on the level of pesticide residues in the cereal products, will be studied. The study will allow for an estimation of processing factors for the selected processes and add to knowledge on the intake of pesticides from whole grain cereals products.

Expected Output: Article on processing factors and effect of baking in per reviewed international journal.

Duration: 2018

67% financed by DTU (staff, consumables and capital equipment

#### Sub-activity 1.07 Cooperation with other EURLs

Objectives: Optimize utilization of resources; enhance mutual exchange of knowledge and experience.

Description: To utilize the resources granted to the EURLs on pesticide residues, each EURL has different horizontal task that covers all EURLs. This includes the EURL portal, CIRCA domain, PT result submission database and webpage etc. and the Scientific Group. To coordinate the activities meetings are organized and emails are used. Two coordination meetings are foreseen. The meetings will probably be held in Spain, one of them in continuation of the Scientific Group meeting.



Expected Output: Not measurable, but short minutes from meetings will be written

Duration: 2018

#### Sub-activity 1.08 Administration and accreditation

Objectives: Fulfilment of administrative duties as well as accreditation requirements. Description:

- 1.8.1 Administrative duties such as drafting budget and work programme, as well as compilation of annual technical and financial report, will be performed according to the requirement issued by the Commission.
- 1.8.2 Maintenance of in-house QA/QC activities in according to ISO 17025 accreditation of all analytical work done within the EURL and ISO 17043 in relation to the proficiency test organized by the EURL. Next audit by the Danish Accreditation Body DANAK will be on 30 January 2018.

Expected Output: Budget 2018, work programme 2018, financial report 2018, Technical report 2018, retention of accreditation.

Duration: On-going

100% financed by DTU (staff)



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## TO PROVIDE SCIENTIFIC AND TECHNICAL ASSISTANCE TO NRLs

Please, provided activities related to Regulation (EU) 2017/625: (Number of Sub-activity boxes can be adjusted by EURL)

- Art. 94.2.d Coordinating practical arrangements necessary to apply new methods of laboratory analysis, testing or diagnosis, and informing national reference laboratories of advances in this field.
- Art. 94.2.e Conducting training courses for staff from national reference laboratories and, if needed, from other official laboratories, as well as of experts from third countries.
- Art. 94.2.g Providing information on relevant national, Union and international research activities to national reference laboratories.

#### Sub-activity 2.01 Providing technical and scientific support to NRLs

Objectives: Service to NRL on request – knowledge sharing.

Description: NRLs occasionally contact the EURL and ask for advice e.g. on purchase of new instrument, analytical problems and mainly via mails

Expected Output: Short report on the number and type of requests from the NRLs

Duration: On going

#### Sub-activity 2.02 Organisation of workshops

Objectives: Enhance the skills of staff from NRLs involved in pesticide control.

Description: A workshop will be organised for the NRLs for cereals and feeding stuff. The workshop will be held in Copenhagen in the period November-December 2018. The agenda for the workshop will include results from proficiency test, discussion on coordinated monitoring programme, analytical challenges, accreditation issues and other relevant issues. One expert from each country will be reimbursed.

Expected Output: Workshop minutes, pdf of oral presentation, evaluation schemes

Duration: 2018



#### Sub-activity 2.03 Organisation of training courses

Objectives: Organisation of training courses.

Description: One day training at the premises of the EURL on basic pesticide residues analyses including sample processing and/or on specific subjects from the SANTE/11813/2017.

Expected Output: Pdf of oral presentations and evaluation schemes.

Duration: 2018

#### Sub-activity 2.04 Visits to NRL

Objectives: Visit to one NRL that underperform in order to help and support them to overcome the obstacle and problems that they encounter.

Description: One NRL visit will be conducted to a laboratory selected in agreement with the COM, where the EUPTs results have been problematic over the last years. The task could be performed in collaboration with other EURLs.

**Expected Output: Mission report** 

Duration: 2018

#### Sub-activity 2.05 Organisation of webinars

Objectives: To disseminate knowledge on specific subject.

Description: One webinar is intended to disseminate information to the NRLs and official laboratories in a cost effective but still interactive way will be organised. The system from EURL-FV will be used.

Expected Output: Pdf of oral presentation

Duration: 2018





# TO PROVIDE SCIENTIFIC AND TECHNICAL ASSISTANCE TO THE EUROPEAN COMMISSION AND OTHER ORGANISATIONS

Please, provided activities related to Regulation (EU) 2017/625: (Number of Sub-activity boxes can be adjusted by EURL)

- Art. 94.2.f Providing scientific and technical assistance to the Commission within the scope of their mission.
- Art. 94.2.h Collaborating within the scope of their mission with laboratories in third countries and with the European Food Safety Authority (EFSA), the European Medicines Agency (EMA) and the European Centre for Disease Prevention and Control (ECDC).
- Art. 94.2.i Assisting actively in the diagnosis of outbreaks in Member States of foodborne, zoonotic or animal diseases, or of pests of plants, by carrying out confirmatory diagnosis, characterisation and taxonomic or epizootic studies on pathogen isolates or pest specimens.

#### Sub-activity 3.01 Technical and scientific assistance to the Commission

Objectives: Support the Commission on relevant issues.

#### Description:

3.1.1 Information on LOQs, residue definitions and standards for Art. 12 MRL reviews, new active substances and other substances, when requested by COM.

Coordinate input for the four EURLs, or provide information to EURL-SRM for coordinated input, on achievable LOQs, availability of standards and comments to suggested residue definition in connection with approval of Reasoned Opinion in connection with art. 12 reviews.

#### 3.1.2 Assistance to COM for the EU MACP and the monitoring working document

Comments and input is given concerning the coordinated multiannual control programme in regard to choice of commodities, scope, candidate compounds, availability of standards etc. Contributions will be made on request and in connection with participation in the annual Expert Working group meeting on pesticides monitoring.

#### 3.1.3 Contribution to the revision of the analytical quality control guidelines

Every second year an updated version of the guideline is issued and made available on the EURL website. Whether relevant improvements and adjustments should be made is an ongoing process and the document is discussed among the EURLs as well as with the NRLs/OfL network on various



occasions. Suggestions for improvement/adjustments are registered and presented in connection with the biennially drafting of the new versions.

3.1.4 General technical support to the Commission On request

Expected Output: Various mails and brief reports

Duration: 2018

Sub-activity 3.02 Collaboration with European and international organisations (EFSA, CEN, ISO, ...) and Third Countries

Objectives: Scientific support to European and international organisations when relevant. Description:

3.2.1 Comments to EFSA on LOQs, standards and methods at the stage of the draft reasoned opinion. Input will be provided on achievable LOQs, availability of standards and comments to proposed residue definitions in connection with approval of Draft Reasoned Opinion (art. 12 reviews) and other matters.

3.2.2 Participation in the EFSA networking group on pesticides residues monitoring EURL-CF will participate in the annual EFSA networking group on pesticides residues monitoring in support to EFSA and the Commission when planning the following year EU multiannual control programme.

Expected Output: Various mail and brief report

Duration: 2018

Sub-activity 3.03 Participation in symposiums, workshops and seminars for the dissemination of scientific information.

Objectives: To promote EU and the EURLs(-CF), disseminate information on activities and scientific results as well as to upgrade the knowledge and skill of the EURL staff in order to support the Commission with the latest knowledge.

Description:

Participation in the European Pesticide Residue Workshop (EPRW2018), Munich, 22-25 May 2018 ( 2 persons)

Expected Output: Pdf file of oral and/or poster presentations and mission report for

Duration: 2018





#### REAGENTS AND REFERENCE COLLECTIONS

Please, provided activities related to Regulation (EU) 2017/625: (Number of Sub-activity boxes can be adjusted by EURL)

- Art. 94.2.j Coordinating or performing tests for the verification of the quality of reagents and lots of reagents used for the diagnosis of foodborne, zoonotic or animal diseases and pests of plants.
- Art. 94.2.k Where relevant for their area of competence, establishing and maintaining:
  - reference collections of pests of plants and/or reference strains of pathogenic agents;
  - ii. reference collections of materials intended to come into contact with food used to calibrate analytical equipment and provide samples thereof to national reference laboratories;
  - iii. up-to-date lists of available reference substances and reagents and of manufacturers and suppliers of such substances and reagents.

#### Sub-activity 4.1 (name of Sub-activity)

Objectives:		
Description:		
Expected Output:		
Duration:		





### REQUIREMENTS RELATED TO OTHER LEGISLATION

Please specify applicable legislation: (Number of Sub-activity boxes can be adjusted)

Sub-activity 5.1 (name of Sub-activity)

Objectives:		
Description:		
Expected Output:		
Duration:		

REMARKS			
(if necessary)			