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Book of Abstracts – Lectures

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Code description

Ex: D1am-P-1 or D2pm-S1-1

- D means **Day** 1 or 2 or 3
- **am or pm** for the morning or the afternoon
- P means **Plenary** with the number corresponding to the rank of the presentations
- SX-Y means **parallel Session** with the number corresponding to the different parallel Sessions (X) and the number of the presentation in the Session (Y)

D1am-P-4. Overview of the EU Customs Laboratories and of the Customs Laboratories European Network

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Every three years, the European Commission carries out a survey in the frame of the Customs Laboratories European Network (CLEN) on the situation and the activities of the EU Customs Laboratories. The presentation will show the results of the latest survey based on the data 2021.

It will be completed by a brief overview of the coordination and support activities of the CLEN for its members and in its quality of WCO Regional Customs Laboratory for Europe.

D1am-P-5. Greening Customs and Chemical Legislation

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Environmental legislation is under development in the last decades and more and products are regulated. Customs legislation and procedures needs to integrate these changes. Some issues are more difficult to be integrated as environmental legislation is not developing at the same path in all parts of the World.

In the European context, after the publication of the Chemical Strategy for Sustainability by the European Commission [1], several chemical Regulations have started its way to be revised. The European Commission identified that the integration of REACH and other chemical legislations into the customs procedures needs to be one of the pillars to enhance the enforcement of the Regulation.

The presentation will give the general context of greening of customs, the chemical strategy and the important elements related to customs. In addition, the potential roles of ECICS and CLEN will be also explored.

References

[1] https://environment.ec.europa.eu/strategy/chemicals-strategy_en

D1am-P-6. Visualising a greener Harmonized System

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The presentation will briefly introduce what has been done in greening the Harmonized System during the previous years and the challenges ahead to introduce additional "environmental goods", including chemical substances in future amendments.

It will also present the outcomes of the series of 5 Symposia on visualising a greener HS held at the WCO to make the HS "greener" and general considerations for future work.

References

[1] https://www.wcoomd.org/en/events/event-history/2022/visualising-a-greener-hs.aspx
https://www.wcoomd.org/fr/events/event-history/2022/visualising-a-greener-hs.aspx

D1am-P-7. "Green customs" from a chemical Industry perspective.

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As chemical industry we focus on two aspects in this presentation: firstly, industry's views on proposals to green HS (Harmonized System), /CN (Combined Nomenclature) codes and secondly, implementation of regulatory provisions (i.e. REACH and green standards in customs procedures.

The focus in the first part is mainly on identified questions by the industry regarding proposals to a greener HS both on a conceptional basis and practically regarding the concrete implementation.

Insights will be shared in the second part of the presentation of how the industry is implementing REACH and other regulatory provisions in its own customs procedures. The intervention will highlight the challenges that industry is encountering and present possible solutions.

D1am-P-8. Greening Customs – A Laboratory Perspective

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In recent years, the awareness has grown that humanity must change its way of thinking regarding the use of the resources available on our planet. In order to stimulate a behavioural change, this awareness has developed in significant policy decisions, on national, supranational and global level. In many cases, the colour green is associated with the goal pursued.

Historically, many customs agencies have been established in order to secure national revenues, whether it be import duties or excise. Gradually the power of customs at the border was recognised by other governmental agencies, and Customs was requested to carry out additional tasks. Often, these tasks were the result of new insights and/or political choices. Many of the historical and new tasks can be carried out by customs officers at the border. However, in numerous other cases goods require some sort of scientific assessment in order to determine its composition or a specific property.

A substantial part of the new legislation regarding the sustainable use of our planet's and its resources is related to limiting and monitoring the use and trade of certain chemicals or living organisms. Typical the field of work of customs laboratories.

This presentation will give an impression in how customs laboratories can contribute to a sustainable society, both in view of the tasks that are already performed and (possible) future tasks, but also from an organisational and process point of view.

D1am-P-9. App CITES*woodID* - Computer-aided identification and description of CITES-protected timbers

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The knowledge about recognition of CITES-protected wood species is of prime importance in the implementation and enforcement of customs controls [1]. A valuable new support for computer-aided wood identification based on macroscopic features is provided by the development of the App **CITES*woodID*** (Fig. 1). The mobile database contains descriptions and an interactive identification system for 53 trade relevant CITES-listed timbers (e.g., ebony, mahogany, rosewood) known for their use as lumber and downstream processing into products. In addition, the database covers 32 traded timbers which can be mistaken for CITES taxa due to a very similar appearance and/or structural pattern [2]. The App is primarily designed for all institutions and individuals involved in controlling the import and export of wood and wood products which are regulated by CITES [3]. It is also well suited for educational institutions teaching wood anatomy and wood identification.

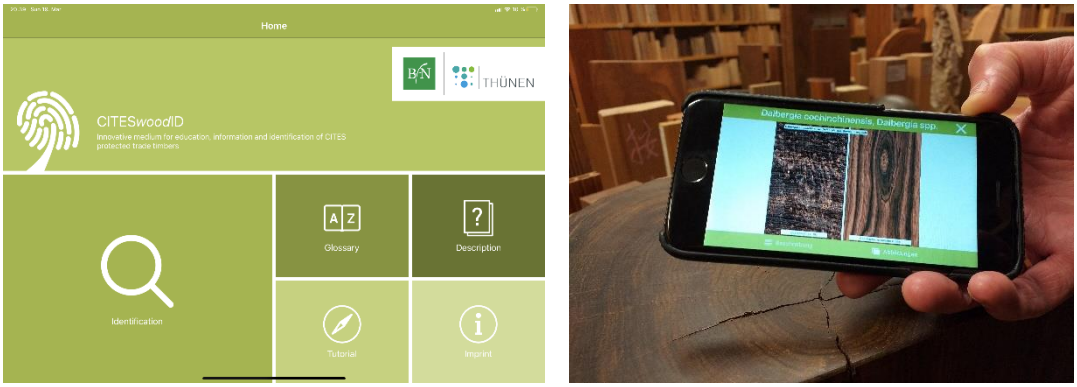

Fig. 1. Desktop of the App CITES*woodID* and recognition / control of CITES protected timber

What has **CITES*woodID*** to offer?

- **interactive identification** of the most important CITES-protected timbers (hardwoods and softwoods) based on macroscopic features to be observed with the unaided eye or with a hand lens
- high **quality colour illustrations** of wood characters and timbers featuring transverse (10x) and longitudinal planes (natural size)
- complete **timber descriptions** accompanied by high quality colour illustrations depicting characteristic wood features
- a **textbook** with definitions, explanations, procedures, etc. for most features used in the description of the timbers in terms of wood structure
- innovative tool for **teaching** at higher educational facilities with a wood science related curriculum (also suitable for Do-It-Yourself education)

The App **CITES*woodID*** is available in four languages (German, English, French and Spanish); free download (App Store® and Google Play®) for smartphone and tablet PC.

References:

[1] Koch, G.; Haag, V. (2017): Viele Anfragen zu Bubinga und Palisander - Auswirkungen der neuen CITES-Listungen wichtiger Wirtschaftsbaumarten für die Holzverwendung und den Holzhandel. Holz-Zentralblatt 143 (13), 313.
[2] Koch, G.; Richter, H-G.; Schmitt, U. (2008): Computer-aided identification and description of CITES protected trade timbers. Bois et Forêts des Tropiques, N° 297 (3), 69-73.
[3] Koch, G.; Richter, H-G.; Schmitt, U. (2011): The data base CITESwoodID - Computer-aided identification and description of CITES-protected trade timbers IAWA Journal 32 (2), 213-220.

D1pm-S1-1. The importance of strengthened cooperation of REACH and Customs controls in entrance points of the EU. The experience of REACH and CLP Greek Competent Authority.

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Almost 90% of dangerous products, due to chemicals, on the EU market coming from imported articles and online sales. There is a need to urgently strengthen the enforcement of chemicals legislation, mainly of REACH and CLP Regulations, in order to ensure compliance for imported products.

Customs Authorities in Greece, are in close cooperation with Chemical Services of the General Chemical State Laboratory (G.C.S.L. of I.A.P.R.), which are NEAs (National Enforcement Authorities) for REACH and CLP regulations. Chemical Services are often found in the same building and act as "Customs Laboratories".

There is much variety in ways in which EU countries arrange their cooperation between NEAs and customs authorities (about 6 models of cooperation). In Greece:

Customs authorities request from NEAs technical support on a regular basis (e. g. information for the imported products necessary for tariff classification). The NEAs take the opportunity to perform REACH and CLP compliance checks for chemical products and take appropriate measures in case of non-compliance. Customs authorities are informed accordingly and decide to "release products for free circulation" or not.

Controls are also performed under targeted compliance check projects like REFs (REACH EN FORCE) and Pilot projects (ECHA-Forum) as well as national targeted projects. In these cases the trigger for checks by customs is the risk analysis of NEAs which leads to a risk profile in the customs IT system. Then customs CAs ask from NEAs to check the compliance of REACH /CLP according to the risk analysis of NEAs.

We fully support the "WG Customs II" (ECHA-Forum) recommendations for the Customs and NEAs CAs cooperation improvement, mainly on:

- promotion of electronic communication with customs,
- common risk management and electronic data sharing between customs and NEAs,
- use customs procedures to enhance REACH and CLP enforcement at the borders (e.g. TARI.C). An excellent example is the integration into TARIC the authorisation of SVHC (Substances of Very High Concern) under REACH,
- harmonization of various details of the national cooperation procedures, such as the risk profiles,
- establishment of regular controls for chemicals during import (not only in campaigns).
- Joint checks by customs and REACH/CLP NEAs

D1pm-S1-2. Intercepting REACH & RoHS non-compliant products before distribution: Overview of 30 years of experience

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The Dutch Customs, Dutch Customs Laboratory and the Human Environment and Transport Inspectorate (ILT) work together for approximately 30 years now. This cooperation started on national legislation and at this moment the cooperation focusses on REACH (Regulation 1907/2006, Annex XVII) and the European Directive 2011/65/EU on the Restriction of Hazardous Substances (RoHS). During these 30 years of cooperation the starting point was, and still is, to intercept non-compliant products *before* these products are distributed further to the different stores or customers. A second starting point is that the cooperation has to be fast, since products are kept on hold pending the analysis results obtained by the Dutch Customs Laboratory.

The practical side of the cooperation is described in a workflow. This workflow contains three basic elements: (1) A pilot phase to identify products and its compounds that pose a possible risk of non-compliance (2) A fast and two-step approach of the analysis itself starting with a screening that, if necessary, is followed by additional quantitative analyses to confirm non-compliance (3) A directional and flexible way to define risk profiles that allow for the selection of relevant samples with a high risk of non-compliance.

After 30 years of cooperation and building up experience the workflow developed into a kind of modular application that readily can be adapted to apply to other entries of REACH resp. other current regulations of the EU.

D1pm-S1-3. Jewellery and metal products in prolonged contact with the skin: laboratory testing and REACH restrictions

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In REACH (Regulation 1907/2006 , Annex XVII) there are three entries concerning consumers and environment protection, with restrictions in jewellery and metal products in contact with skin: nickel (Entry 27), cadmium (Entry 23) and lead (Entry 63).

For lead and cadmium the restriction relates to their content in metal parts of jewellery and imitation jewellery. On the other hand, the nickel restriction is about **the rate of release** from post assemblies inserted into pierced parts of the human body and articles in prolonged contact with the skin. The migration limit of nickel is expressed as μg/cm^2 per week, therefore, apart from the testing itself, it's crucial to identify and measure the actual surface area that comes in contact with skin or is inserted into pierced body parts.

In this project, the main points of testing of various types of jewellery- metal products that come in contact with human skin will be discussed. Specifically the work will focus on the critical points such as the ways of articles dismantling, the surface area measurement, as well as the exact conditions of the simulation in an artificial sweat test solution and the measurement of dissolved nickel at the end of the release procedure.

Finally, information will be provided on testing results performed on samples during Customs control.

D1pm-S1-4. Safety of Toys (Directive 2009/48/EC): physical-mechanical properties and chemical tests on imported toys

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To preserve safety and health of children, by preventing dangerous toys to be placed on the market, Italian Customs Agency (ADM) does document and physical checks. Particular safety requirements are described in the Directive 2009/48/EC and they are: Physical and Mechanical Properties; Flammability; Chemical Properties; Electrical Properties; Hygiene; Radioactivity. Harmonized standards for toys are reported on Commission Implementing Decision (EU) 2019/1728. For physical-mechanical tests the reference standard is EN71-1:2014+A1:2018, based on Annex II, Directive 2009/48/EC. The EN 71-1 is splitted in chapters. The fourth one concerns general requirements, obligatory for all toys, like edges, point metallic wires, protruding parts for example. More restrictive conditions are prescribed for toys intended for children under 36 months, as reported in chapter 5. For example, these kinds of toys and their removable parts shall not fit entirely in small parts cylinder or they shall not contain small balls. Also requirements for packaging are contemplated in the EN 71-1, in the chapter 6, to avoid choking hazards. Chapter 7 is dedicated at warnings, that must draw the attention of users on the pertinent dangers. For chemical properties there are more standards; for the metals the reference standard is EN 71-3:2013+A3:2018, that contemplates an ICP analysis on sample, after migration, simulating gastric juices digestion. Any tests are not provided by harmonized methods, but they are prohibited under Regulation (EC) No 1907/2006 (REACH), as phthalates, whose analysis is well described by ISO 8124-6, that expects GC-MS analysis after solvent extraction in dichloromethane.

D1pm-S2-1. Green Customs

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Based on the UN Sustainable Development Goals German Government developed a sustainability strategy and an agenda to implement it in its administration. The agenda tends to climate neutral administration until 2030 and deals with buildings, mobility, provisioning, events, catering, training, health, equal chances and diversity.

Derived from the Paris Agreement on climate change German government also developed a climate protection agenda. One of its aims is that 10 % of its administration localities should introduce an Eco-Management and Audit Scheme (EMAS) in the following years. In German Customs Administration two locations started as EMAS pilot project about 12 years ago. Many others will succeed from 2023 to 2026.

EMAS [1], developed by the European Commission, is a voluntary environmental management instrument based on ISO 14001 with special additions featuring the participation of staff and reports on key performance indicators like energy and material efficiency.

The presentation shows the experience on EMAS in the pilot project and presents the ongoing processes of EMAS and the mentioned agendas of sustainability and climate neutral administration in German Customs.

References

[1] Regulation (EC) No 1221/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS)

D1pm-S2-2. The sustainable laboratory

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The laboratory is an essential part of the working environment of customs inspection offices. Preparation and chemical analyses of diverse materials and substances require state-of-the-art laboratory equipment and devices while maintaining high occupational health and safety standards. What are the building blocks and tools for constructing a sustainable laboratory building? What does sustainable design mean in the planning process? Which materials are suitable? The worsening climate crisis and extremely rising energy costs require new ways of thinking and courageous decisions. From innovative individual approaches to a holistic view. A brief history of sustainability in the laboratory with a view to the future: the climate-neutral laboratory.

References

[1] Auf dem Weg zum klimaneutralen Labor, dr. heinekamp Labor- und Institutsplanung GmbH (2022)

D1pm-S2-3. Regulation (EU) No 517/2014 of the European Parliament and of the Council on fluorinated greenhouse gases - experiences from a Customs Laboratory

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The European Parliament Resolution of 14 September 2011 on a comprehensive approach to non-CO 2 climate- relevant anthropogenic emissions welcomed the Union's commitment to support action on hydrofluorocarbons under the Montreal Protocol on substances that deplete the ozone layer ('Montreal Protocol') as a prime example of a non-market based approach to reducing greenhouse gas emissions. Effective monitoring of fluorinated greenhouse gas emissions is critical for tracking progress towards the achievement of emission reduction targets and for assessing the impact of this legislation. Gradually reducing the quantities of hydrofluorocarbons that can be placed on the market has been identified as the most effective and cost-efficient way of reducing emissions of those substances in the long term. To implement the gradual reduction of the quantities of hydrofluorocarbons that can be placed on the Union market, the Commission should allocate quotas to individual producers and importers for the placing of hydrofluorocarbons on the market in order that the overall quantitative limit for the placing hydrofluorocarbons on the market is not exceeded. The Commission shall ensure that the quantity of hydrofluorocarbons that producers and importers are entitled to place on the market in the Union each year does not exceed the maximum quantity. The placing on the market of products and equipment listed in the Annex III (of Reg.517/2014), with an exemption for military equipment, is prohibited. The General Chemical State Laboratory of Greece, acting as a Customs Laboratory, is strongly involved in this Regulation for the protection, against the overuse of these FCKWs offering analytical experience, facilities and the use of specific instruments. Such instrumentation and the results obtained during the last years, will be presented.

References REGULATION (EU) No 517/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 April 2014 on fluorinated greenhouse gases.

D1pm-S2-4. Tackling Air Emissions – Directive (EU) 2016/802 of the European Parliament and of the Council of 11th May 2016 relating to a reduction in the sulphur content of certain liquid fuels

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Pollution derived from maritime shipping activities has profound implications not only for air and water quality but also for marine and estuarine biodiversity. As a result of various onboard combustion and energy transformation processes, ships emit various air pollutants into the atmosphere. The main ones are Sulphur oxides (SOx), Nitrogen oxides (NOx), particulate matter (PM) and carbon monoxide (CO).

In September 2020, the Commission adopted a proposal to cut greenhouse gas emissions by at least 55% by 2030 and put the EU on a responsible path to becoming climate neutral by 2050.[1] To achieve climate neutrality, a 90% reduction in transport emissions is needed by 2050. All transport modes, including maritime transport, will have to contribute to the reduction efforts.

To control SO_2 emissions from ships, the Sulphur content of marine fuels has been regulated in the EU since 1999 and continuously monitored since then following the procedures described in Directive (EU) 2016/802. The Directorate of Energy, Industrial and Chemical Products of the General Chemical State Laboratory (GCSL) of Greece is the Competent Authority for the implementation of the aforementioned Directive, namely the "Sulphur-Directive'', within the Greek territory.

The implementation of the Directive involves onboard inspections, from well-trained personnel, were marine fuel samples are collected and sent for analysis to the accredited laboratories of the GCSL. The legal framework covering the "Sulphur-Directive", together with the results of the ships inspections, always according to the demands of the Directive, will be displayed in the corresponding presentation.

References:

[1] COM(2020) 563 final

D1pm-S3-1. Operation OPSON, a project on food frauds

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Operation OPSON is a Europol/Interpol joint project, which started in 2011 on the initiative of few countries with the main intention of safeguarding public health. Its scope has been implemented by assisting the Member States in fighting criminality associated with production and trade of counterfeit and substandard food and with the purpose of raising public awareness regarding the risks of buying those kinds of products. The operational objectives have been better developed and applied more extensively in the following years.

The project, currently at its twelfth edition, has become a recurrent operation, involving an average of 70 participating countries every year. In addition to Europol and Interpol and their national Law Enforcement Agencies from Police and Customs, there are also the Food Regulatory Agencies. Other participants are DG SANTE and the Food Fraud Network, DG AGRI, OLAF, FRONTEX, JRC, EFSA, FAO and several representatives from the food industry.

References

https://www.europol.europa.eu/cms/sites/default/files/documents/opson_ix_report_2021_0.pdf.

D1pm-S3-2. Collaboration between Finnish Customs and the Finnish Food Authority aims to prevent and reveal crime in the food chain

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Finnish Customs, Enforcement Department, Head of International Affairs Team

The Finnish Customs and Finnish Food Authority have initiated a collaborative project to prevent food fraud. The project focuses on preventing food fraud in cross-border goods transport in accordance with a dedicated action plan. Food fraud is highlighted as one of the key phenomena of international fraud in the Finnish strategy and action plan for tackling grey economy and economic crime in 2020–2023.

The collaborative project has produced valuable information on how to enhance the collaboration between Finnish Customs, the Finnish Food Authority and the municipal food control authorities. Enhancing collaboration and increasing cooperation between countries, we could achieve even better results in the future concerning revealing and investigating food frauds.

D1pm-S3-3. Laboratory techniques applied in the GCSL, A ACS, Greece for the determination of food fraud and authenticity

C. Sakellariou [1], S. Bergele[1], P. Blika[1], S. Iosifidou[1], G. Karygiannis[1], O. Rompokou[1], I. Gardikis[2] and **C. Alexopoulos[1]**

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[2]General Chemical State Laboratory, A' Athens Chemical Service, Department C', Greece

Food fraud is in general related to the commercial aspects of foodstuffs and focused on the deception of the customers. The most prevalent type of food fraud is manifested by means of:

(a) misrepresenting labelling requirements, (b) substituting one product for another and (c) adulteration. Our lab in General Chemical State Laboratory, A' Athens Chemical Service, Dpt A' in Greece, is engaged in the analysis of honey, virgin olive oil, sugars and food additives (food colours, sweeteners, preservatives, etc). In this contribution, we report on the use of different analytical techniques/methodologies in order to:
(A) determine: [1] the sugar content by means of HPLC-IR, [2] the botanic origin of sugars by means of IRMS, [3] the honey adulteration with C3-sugars by EA-IRMS, [4] the honey adulteration with C4-sugars by LC-IRMS,
(B) classify a virgin olive oil by means of organoleptic assessment (panel),
(C) verify a suspicious blending in a virgin olive oil by the determination of physicochemical parameters,
(D) determine the purity of food dyes
(E) detect illegal food dyes by LC-MS/MS
(F) characterize samples in relation to Meursing Table (successful participation in CLEN PTs).

References

[1] AOAC official methods of analysis No 998.12, C-4 plant sugars in Honey, Internal standard stable carbon isotope Ratio method, edition 21st, Volume III, 2019, Association of the Official Analytical Chemists, Washington, DC, USA.

[2] AOAC official methods of analysis No 984.23, corn syrup and cane sugar in maple syrup, carbon ratio spectrometric method, edition 21st, Volume III, 2019, Association of the Official Analytical Chemists, Washington, DC, USA.

D1pm-S3-4. Basmati rice identification: DNA analysis and data interpretation challenges

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According to EU regulations 972/2006, 272/2010 and 706/2014, nine Basmati rice varieties are exempt from import duties. At the Dutch Customs Laboratory, DNA analysis is performed to verify declaration of the variety listed on the certificate of authenticity. The applied microsatellite method was initially developed in 2004 by Bangor University (UK) in cooperation with the Food Standard Agency (UK) [1]. Using this method, DNA profiles of Basmati rice samples are determined which are compared with DNA profiles of a set of reference samples.

However, over time new Basmati rice varieties have been developed, having their own fingerprints which are (slightly) different from the fingerprints of their ancestors. Unfortunately, no established procedure is described in the regulation with regard to the precise determination/ interpretation of DNA profiles of Basmati varieties. Currently we have arrived at a situation that for about 65% of the samples it is not possible to conclude about the exact variety. Roughly half of the bulk imports of rice from India under CN code 1006.2098 enters the EU via The Netherlands (Eurostat data), indicating a potential financial gap.

Enforcement of the regulation calls for a proper (re)definition (in terms of DNA profiles) of the eligible Basmati rice varieties and requires availability of up-to-date reference materials.

[1] M. Woolfe and K. Steele, Food Chemistry, Function and Analysis No.16, DNA Techniques to Verify Food Authenticity: Applications in Food Fraud, Edited by M. Burns, L. Foster and M. Walker, The Royal Society of Chemistry (2019) 207-218.

D1pm-P-1. Sports Drug Testing & the Athlete's Exposome

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Analytical approaches in sports drug testing are continuously updated and expanded, exploiting new information on drug metabolism and disposition in humans as well as innovations in sample preparation and analysis, and also novel strategies focusing on marker-based test methods have been assessed, developed, and implemented. The resulting improved detection capability and retrospectivity of sports drug testing approaches has considerably limited the formerly available options of substances and methods of doping. In addition, however, and similar to the general population, elite athletes are exposed to a complex set of environmental factors including chemicals, biological and physical stressors, which constitute an exposome that is, unlike for the general population, subjected to specific scrutiny for athletes due to applicable anti-doping regulations and routine doping controls.

Test methods in sports drug testing, relying largely on chromatographic-mass spectrometric methods, were optimized and applied to newly identified challenges, including e.g. the detection and characterization of superior metabolic products of prohibited as well as non-prohibited substances, aiming at enhancing the analytical data available for decision-making processes in test result management. Additional information, resulting from controlled (microdosed) elimination studies and simulations of contamination scenarios, complements the dataset of routine doping controls, which can offer critical information as to the time point of drug exposure and/or the source of the target analyte in athletes' doping control sample.[1]

References

[1] M. Thevis, T. Kuuranne, M. Fedoruk, H. Geyer, Drug Testing & Analysis 13 (2021) 1814-1821.

D2am-P-1. Renovating an ISO 17025 Laboratory without shutdown

B.N. Zegers, G.C.M. Koomen, R.C.M. de Groot, P.J.J. Schermer, J.P. van Deventer

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The history of the Dutch Customs Laboratory dates back to 1880, when two governmental laboratories for the determination of sugar were established. Since then, our world has changed drastically. Although the Dutch Customs Laboratory still determines the sugar content in food and feed, a plethora of other analyses are performed. Furthermore, the laboratory has moved several times to another building, with the last change of building in 1995. Such movements are always a huge challenge and require a thorough preparation both from an analytical point of view, but also regarding the alignment with stakeholders.

Some 12 years ago, a regular check revealed a structural issue concerning our fume hoods which required drastic measures in order to solve the issue. The laboratory would be out of service for a serious period of time. Therefore, the situation was seized to renovate the entire laboratory to meet modern requirements. It did mean that the whole building would need to be empty. However, there was no “spare laboratory” ready at our disposal, and Dutch Customs could not do without a laboratory for more than a few days. Furthermore, in view of our tasks and possible legal implications, our ISO 17025 accreditation could not be suspended.

This presentation will take you on a renovation road trip, past governmental bureaucracy, tenders, making choices, downsizing, accreditation requirements, forces of nature, lots of flexibility and a waterfall, to end up in a new laboratory.

D2am-P-2. Presence of fraudulent mineral oil in 2022

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Designer oil issue goes back at least to 2011. In the frame of an ISEC program the GC chromatograms of designer fuels already were presented. From that time the name of "Designer oil" became popular among the Customs officers, among the members of the customs laboratories. Several variation of the fraudulent mineral oil is created by the fraudsters.

The authorities try to eliminate and prevent this type of abuse by making numerous legislative changes and amending the text of the CN. The changes resulted in a further modification of the composition of mineral oils suitable for abuse.

This presentation is based on a Survey circulated in EU, within the CLEN. The questions of this Survey covered designer fuels (diesel and gasoline) and the misuse of tax reduced fuel, with Euromarker marked diesel. A presentation of the current situation of designer oil fraud in EU Member States could be interesting and profitable.

D2am-P-3. The new Euromarker ACCUTRACE ™ Plus - Detection and Quantification by 2D-GC/FID/MS

D. Jacobi

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The Euromarker Solvent Yellow 124 and the national colouring dyes currently in use for tax rebated gas oils are easily removed by simple chemical or physical procedures. Only in rare cases, laundering facilities were detected and the removal of fiscal marker dyes was proven. Therefore, the loss of tax revenue across the EU is unpredictable. In 2015 DG-TAXUD decided to open a call for expression of interest for a more robust marker to replace Solvent Yellow 124. After intensive testing of 4 marker candidates, the choice was on ACCUTRACE ™ Plus with the active marker compound n-Butylphenylether (BPE). Detection of BPE in matrices of gas oil or kerosene requires an advanced technique. The needed 2D-GC/FID/MS technique is a highly sensitive and specific procedure, but it is not very common within the CLEN-labs.

This presentation gives an overview about the principle, required instrumentation and obtained validation results so far. Moreover, it provides an outlook on the development of the community reference method for the determination of the new Euromarker in gas oils and kerosene.

References

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D2am-S1-1. **Overview of low-field NMR applications at the Customs Laboratory of Paris (SCL)**

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The lecture will deal with the potential of NMR in chemical analysis dedicated to Customs regulation on narcotics.

The Paris laboratory of the SCL has been equipped for several years with a benchtop LF-NMR which allows to perform ^{1}H, ^{19}F or ^{13}C experiments in 1D or 2D.

The laboratory performed different applications with this equipment. Some examples will be presented, including the quantification of molecules in proton NMR and fluorine NMR, but also the identification and structure elucidation of new substances.

As far as the French laboratory department is about to purchase a high-field NMR, the potential of this equipment for our applications will also be discussed.

D2am-S1-2. Accreditation of identification of unknown substances by NMR

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The analysis technique Nuclear Magnetic Resonance (NMR) has found its way to an increasing number of customs laboratories. The development of benchtop NMR has boosted that number even further.

NMR analysis is often used for the identification of unknown substances, which after identification often appear to be related to illegal activities, e.g. narcotics. In view of the legal implications of these identifications, validation and accreditation of NMR methods used for the structure elucidation of unknown compounds is highly desirable.

Other than for quantitative NMR, unfortunately virtually no validation protocols are available for NMR identification methods.

This presentation will introduce the protocol currently applied by the Dutch customs laboratory, in order to achieve accreditation under the ISO 17025 scheme and other related documents. The introduced systematic is based on ideas which are concluded to be compliant with the requirements of the ISO 17025, but without having been confirmed by the Dutch accreditation body yet. The aim of this presentation is to share our methodology in order to ease the initialling process for other laboratories and to discuss possible improvements.

D2am-S1-3. Benchtop-NMR-Spectroscopy – an analytical technique for quantitative determinations

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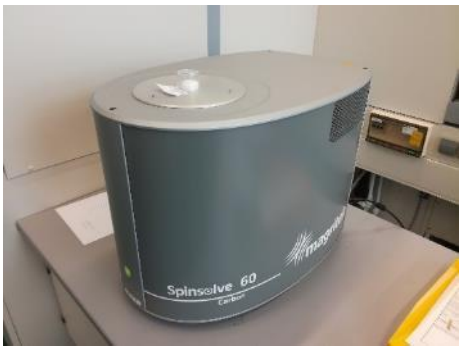
NMR technology has not been used in many laboratories so far, as NMR spectrometers are very expensive, have high maintenance costs and require experienced operators. This is not the case with compact Benchtop-NMR-spectrometers based on permanent magnets with field strengths up to 80 MHz. Significantly lower acquisition and operating costs as well as a simple user interface make the operation of Benchtop NMR spectrometers in many laboratories possible, including the German customs laboratory in Berlin. Here the 60 MHz device is not only used for identification but also for quantification of suspicious substances.



Gas or liquid chromatographic methods are usually used for the quantitative determination of narcotics, drugs or new psychoactive substances. These methods require generally a calibration with standard material of the analyte to be determined, so the availability of a suitable standard is a crucial point. This problem does not occur with quantitative NMR (qNMR) spectroscopy. In qNMR spectroscopy it is not necessary, that the standard has the same or a very similar chemical structure as the analyte. Thus, the problem of unavailability of suitable standard material can be avoided and the commercial availability of a large number of certified standard substances for qNMR spectroscopy facilitates the application of the method. For the analysis of organic analytes, typically only a few milligrams of substance per sample are required.
The qNMR is a primary analytical method that measure the amount of a substance directly. That results from the direct proportionality of the number of cores (^{1}H) in the measured volume of a sample with the signal area in the ^{1}H-spectrum.
The lecture highlights some quantifications with our Benchtop-NMR-spectrometer.

D2am-S2-1. The use of chemometrics to detect spirit drinks frauds

S. Arduini

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In the study [1], born from the collaboration between the Customs Chemical Laboratory of Bologna and the University of Bologna (Department of Chemistry "G. Ciamician"), 123 distillates, all of Trentino or Veneto origin belonging to different categories of spirit drinks, were analyzed in their alcohol content by electronic densimetry, and in their volatile fraction by gas-chromatography with a flame-ionization detector with the aim of building and validating a chemometric classification model to be used to verify the authenticity of grappa samples. The chemometric method used for the construction of the model was the LDA (Linear Discriminant Analysis) and the validation of the model has been carried out both with the statistical method of *cross validation* and through the use of an *external test set*. Both methods have provided a "non error rate" of more than 97% confirming the model's good predictive capabilities. The model, that in the study was used to verify the authenticity of two samples of grappa could be used as a quick screening method to verify a possible adulteration on a suspect sample. The model also lends itself to being expanded and made even more robust and generic by increasing the number and categories of beverages used for its construction.

References

[1] Arduini, S.; Zappi, A.; Locatelli, M.; Sgrò, S.; Melucci, D. An Authentication Study on Grappa Spirit: The Use of Chemometrics to Detect a Food Fraud. *Analytica* **2021**, *2*, 84-92. https://doi.org/10.3390/analytica2030010.

D2am-S2-2. Analytical characterization of microbial oils: A valuable tool forfraud detection in ω-3 dietary supplements

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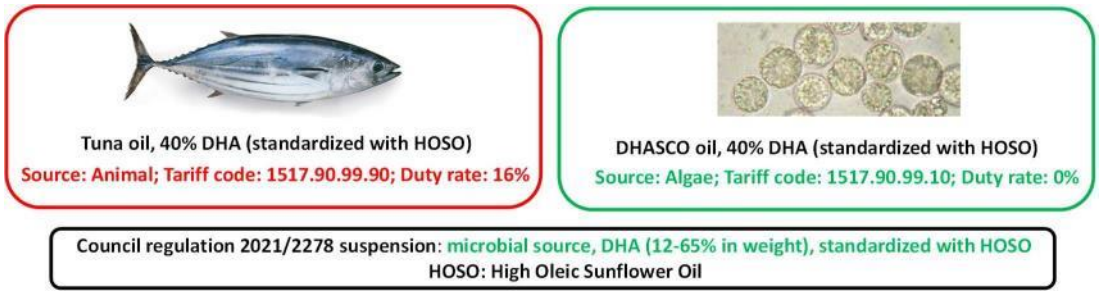
Highly unsaturated omega-3 fatty acids (ω–3) such as EPA (eicosapentaenoic acid, C20:5), and DHA (docosahexaenoic acid, C22:6) perform essential functions throughoutthe body and have been associated with significant health benefits including preventionof heart disease and rheumatoid arthritis. Nevertheless, the body cannot produce them from scratch and it must be obtained from the daily diet, mainly from fish, algae and dietary supplements.

In the last years, the use of dietary supplements has exponentially increased to overcome ω-3 deficiencies, with an estimated market of 2.10 billion dollars in 2020. Preparation of the supplements begins with the extraction of the ω-3 rich oils, from different sources, such as, fish and microorganisms. Microbial oils are the first choice option, because they are sustainable and do not contain the pollutants present in fish oils. Unfortunately, the production of these oils in the EU is currently inadequate to meetthe requirements of our industry. For these reasons, the EU has recently suspended the tariff duties on certain microbial oils, but not on the equivalent products with animal origin(**Council regulation 2021/2278**, Figure 1).

Figure 1. Tariff classification of DHA rich oils, according to the oil's source and DHA content.



As shown before, for a correct tariff classification of these products, it is mandatory to identify the source of the oil, but also the exact content of each ω-3 acid. In this contribution, we aim to share our experience in the analytical characterization of microbial oils to prevent both consumer and duty frauds. For instance, we have successfully identified the organism used in the production of the oil, by analyzing the triglyceride, methyl esters and sterol profiles (GC-FID and GC-MS). Moreover, we have accurately quantified the content of each omega acid in the preparations, employing theinternal standard technique (GC-FID).

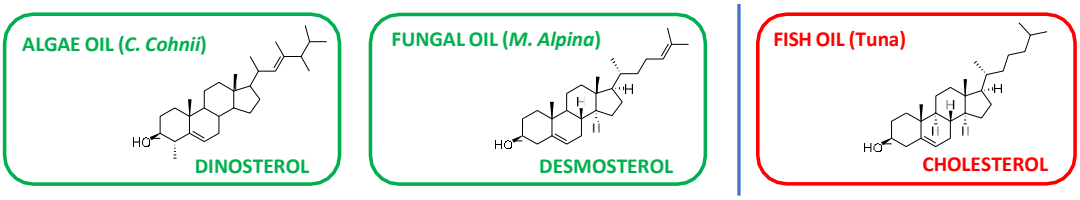


Figure 2. Analytical characterization of ω-3 rich oils to prevent consumer and duty frauds.

D2am-S2-3. Expert system for the characterization of vegetable oils analyzed by gas chromatography

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Eidgenössisches Institut für Metrologie METAS

The characterization of oils is carried out with regard to their fatty acid composition. In view of the diversity of existing vegetable oils and the difficulties related to their natural variation, an expert system is being developed to assist in the evaluation of these oils in the context of customs pricing.

Analytical results of gas chromatography (GC-FID) of edible oils from the last 20 years have been used to model their fatty acid distribution. Various machine learning algorithms have been tested and evaluated in order to select the most adequate. Afterwards, a graphical interface for decision support was developed. Based on the fatty acid values of the sample under study, the system reports scores of similarities with respect to the reference distributions (Figure 1). This project is still in progress, improvements and practical implementation are planned. The preliminary results are promising.

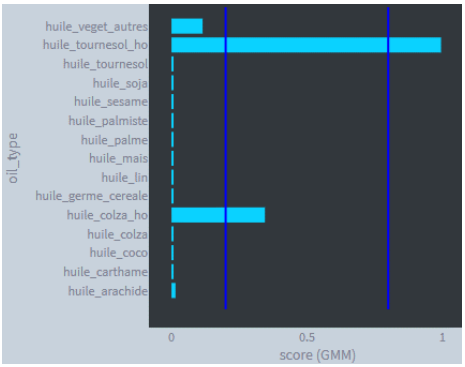

Figure 1: graphic interface proposal

D2am-S2-4. The EU Novel Food Regulation and hemp-derived products

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Overview of Regulation (EU) 2015/2283 and the novel food status of cannabidiol and other products derived from the hemp (Cannabis sativa L.) plant.

D2am-S3-1. Mask tests: critical issues and new regulatory proposals

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In 2020 Italian Customs and Monopolies Agency (ADM) has carried out the development of the mask tests to support national authorities in the fight against the spread of the Covid-19 pandemic. Tests were conducted and accredited by national body accreditation ACCREDIA, according to the standard EN 14683:2019 for medical face masks and according to the standard EN 149:2009 for filtering face masks FFP.

Several critical issues have been overcome in order to be able to perform a large number of samples quickly, with special attention to breathability tests and filtration efficiency tests.

Both types of face masks, already in use before the pandemic in the healthcare sector and as protective equipment have proven effective in counter the spreading of the Covid-19 virus but, in order to improve the features of the masks by adapting them to any possible future pandemic event, it was created a technical committee, which ADM is a part of, to produce a new standard that combines the characteristics of the 2 types of face masks: CEN/TC 205/WG 17 "Infection protection masks".

Furthermore, thanks to the experience gained, ADM has also proposed some improvements to the standard EN 149:2009 within the technical committee CEN/TC 79/WG 9 “Respiratory protective devices – Test methods”, of which ADM is too a part.

D2am-S3-2. Activities of the European Commission's 'Joint Research Centre' on nanomaterials in food

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Nanotechnology is one of the key enabling technologies that has a variety of applications in the food sector including food manufacturing, processing, and packaging. Besides its benefits, also concerns on the presence of (engineered) nanomaterials in food, its ingestion and potential health effects have been described.

The European Union is recognized worldwide to have a high quality and safety food standard, ensuring the protection of the health and consumer interest of the European citizens while allowing the well-functioning of the single market. With regards to nanomaterials the requirements of EU food legislation are set up in the novel food Regulation that includes a definition of engineered nanomaterials that is also directly applicable to other EU food legislation (e.g. Regulation (EC) No. 1333/2008 on food additives and Regulation (EU) No. 1169/2011 on food information to consumers) .

To address potential concerns the European Food Safety Authority (EFSA) has developed extensive and comprehensive guidance on the risk assessment of nanoscale materials (and conventional materials containing a nano-fraction) in food and feed. However, the identification and characterization of nanoparticles in food suffers from the unavailability of validated analytical methods, the lack of (certified) reference materials and in some cases insufficient technical/analytical capacities and knowledge of the laboratories in charge of compliance testing.

The Joint Research Centre, in collaboration with the Directorate-General for Health and Food Safety (DG SANTE) addresses some of these shortcomings and supports Member State competent authorities in the implementation and enforcement of the current nanomaterials-related food legislation.

The presentation provides a general overview on the above activities and the related analytical techniques used for nanoparticle analysis.

D2am-S3-3. **Handheld screening of cannabis**

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Since 2020 there has been a large increase of low THC cannabis in Sweden as well as in Europe. [1] Bruker has published an application note that high and low THC cannabis can be distinguished by FTIR. [2] Co-workers in Belgium have been using this technique since at least 2019. [3] The analysis is performed directly on the cannabis buds without prior sample preparation. The current work shows that this can also be done with cannabis resin. The procedure has also been extended to FTIR screening of cannabis with handheld FTIR instrument.

References

[1] European Monitoring Centre for Drugs and Drug Addiction, Low-THC cannabis products in Europe, Publications Office, 2020, https://data.europa.eu/doi/10.2810/69625

[2] Bruker Application Note AN M157 Differentiation of THC and CBD cannabis using FTIR

[3] Presented at CLEN Webinar on Cannabis and Cannabinoids 2020

D2am-S3-4. From b to y ions, a decade of experience with peptide and protein analysis for controlling agencies

C. Vanhee, M. Willocx , S. Janvier and E. Deconinck

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Recent advances in genomics, proteomics, recombinant expression technologies, and peptide synthesis have led to an increased development of protein and peptide therapeutics. Due to improved and simplified manufacturing techniques, disregard for patent protection, and a growing global market for non-approved drugs, several peptide or protein drugs are being manufactured illicitly and are being made available to the public before entering or completing clinical trials. The Belgian Federal Agency for Medicines and Health Products (FAMHP) and customs are striving, together with their global counterparts, to curtail the trafficking and distributions of these substances. At the request of the FAMHP, unknown pharmaceutical preparations suspected to contain illegal protein and/or peptide drugs are regularly subjected to analysis by our OMCL laboratory. Here, we present and discuss the techniques we employ to analyze such samples and give an overview of the substances we've encountered during the last decade [1-4].

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[2] C. Vanhee, S. Janvier G. Moens, et al. Drug Testing and analysis 9 (2017) 831-837.

[3] C. Vanhee, S. Janvier, G. Moens, et al., Journal of pharmaceutical analysis 6 (2016) 326-334.

[4] S. Janvier, B. De Spiegeleer, C. Vanhee, et al., Journal of pharmaceutical and biomedical analysis 161 (2018) 175-191.

D2pm-S1-1. ISO 17025:2017 - Six years in force – a summary of experiences

F-M. Sieberth

Austrian Customs Laboratory

In this lecture an overview is given of what has changed after the introduction of the 2017 version of the ISO 17025. It sums up our experiences with the changes in risk management, impartiality, competence assessment etc. What to do with opportunities and changes and how we did try to give proof of our validity of our results. It draws out the necessities for a complying IT Network and how to proceed with the verification of our standard methods. The presentation deals with metrological traceability and how to control and document facilities and environmental conditions. Examples will be given for defining those chances and opportunities. It will be a practical report of our endeavours since 2017.

D2pm-S1-2. The experience of the Italian Customs and Monopolies Agency in the Multilab accreditation to ISO/IEC 17025

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The technical analytical sector of the Italian Customs Agency is structured in 16 chemical laboratories accredited by more than 15 years to the international standard ISO/IEC 17025. In 2020 the accreditation as "multisite testing laboratories" has been obtained.

A multisite laboratory is a single legal entity, consisting of more secondary units and a central site where a series of activities take place. The central site has the task of coordinating the other sites and carrying out a single quality management system (QMS) in compliance to the ISO/IEC 17025 and the additional requirements of the national accreditation body, ACCREDIA. The QMS is applied in all sites, both central and secondary, providing a greater uniformity between different locations.

The central site is responsible of issuing and updating of the general procedures and test methods, of the management of an intranet network for equipment, materials, non-conformity activities and corrective actions. It verifies the fulfilment of the accreditation requirements in all the secondary sites thanks to a continuous interchange of information and regular internal audits. In the central site is also located the "Proficiency Testing Sector" and the core of the informatic system, SisLab and LIMS, tools for the management of the samples.

The goals of this model of accreditation are many, but first and foremost, is a strong sharing of knowledge and technical competence throughout the different units. The experience of a single laboratory becomes an improvement for the other sites, enforcing the competitiveness of the whole Agency.

D2pm-S1-3. Estimation of Sampling Uncertainty and its Contribution to Measurement Uncertainty

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According to the requirements of the standard ISO/IEC 17025:2017, laboratories must identify all sources that contribute to the uncertainty of measurement, including those arising from sampling. This paper presents the estimation of uncertainty in measurements of alcoholic strength concentration of products with alcohol, using the empirical (or "top-down") approach, according to the Eurachem and Nordtest guides, covering different levels of concentrations.

Samples were taken from eight sampling targets in duplicate and randomly selected to represent the typical composition of the sampled material. Each of the two samples was analysed in duplicate under conditions of repeatability, to determine the alcoholic strength. The RANOVA (Robust ANOVA) software of Microsoft EXCEL (an Excel Add-in) was applied, through which a robust analysis of the variance was performed.

The values of typical uncertainty of sampling obtained were compared with the reproducibility of the method already calculated by the laboratory. The total measurement uncertainty was estimated, taking into account the sampling and the other factors that the laboratory had already identified and assessed. The results obtained, showed that the contribution of sampling to the uncertainty of the measurement, was not statistically significant, due to the homogeneity of the materials studied.

D2pm-S1-4. The innovative role of the Italian Customs and Monopolies Agency as Product Certification Body in compliance to ISO/IEC 17065

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Italian agri-food products are a high-profile sector on the international market. The certification that a product originated in a specific geographical area, which influences its quality, reputation or other characteristics, is a great added value for the country's economy, especially for export goods to fight counterfeiting and the phenomenon of the “Italian sounding”.

In Italy, the control activities on protected agri-food products are carried out by Certification Bodies or Designated Public Authorities, operating in accordance with REGULATION (EU) 2017/625, on the basis of “Control Plans” authorized by the in charge Ministry.

Since 2016 Italian Customs and Monopolies Agency carries out the product certification activity for two regional spirit drinks geographical indications, in the area of Piemonte and Valle d’Aosta.

Recently the Italian Customs and Monopolies Agency collected the interest of many national producers' associations for the product certification, mainly for spirit drinks and aromatized wines, obtained by a public administration to guarantee effectiveness, impartiality and transparency, as well as expertise in analytical controls.

By this reason has been created an organization to carry out inspections and analytical controls on the basis of the “Product Specifications” and “Control Plans”, which will soon be accredited according to ISO/IEC 17065.

D2pm-S2-1. Current state of Mobile diagnostics within Czech customs

B. Bažilová, L. Rozkovcová, **R. Schoula**
Customs Technical Laboratory, General Directorate of Customs, Budějovická 7, Praha 4

Various means of mobile detection equipment used for customs control and services will be presented. In addition to highly sophisticated large technologies such as large capacity mobile X-ray vehicles, mobile laboratory and the well-known and traditional canine detection, various small hand-held spectrometric devices are properly used.

A brief description of the equipment used, some examples of routine applications, and the potential for possible future development will be mentioned in the area of customs activities (such as customs clearance, prohibitions and restrictions), but also in the area of control of excise products.

The mobile laboratory developed for traffic control department with the unique built-in sampling (pumping) system for sampling from bottom loading fuel trucks was presented at the last SECC. Since then, the continued use of small handheld devices has been widely promoted within the Czech Customs Administration. For instance, Raman and Infrared spectrometers are quite common for the detection of unknown or false declared chemicals (narcotics, NPS) through packages in the Czech airport border. The mobile XRF spectrometer is used for metal-based material analysis and detection of toxic elements (Cd, Hg, Pb). The other types of handy instruments are employed in excise control – the simple refractometers are used for quick check of alcohol content; aerometers measurement sets and handheld oscillation densimeters are used for exact alcohol determination; and in the enforcement activities the various backscatter X-Ray Imagers are employed to reveal hidden places and/or contraband, the ion-mobility based instruments to detect traces of narcotics etc.

The Customs Laboratory of the Czech Republic is a professional authority that broadly supports the use of mobile diagnostics within the Customs Administration of the Czech Republic, including methodological and coordination activities, management of the database of diagnostic instruments, provision of preventive checks for correct operation, maintenance, as well as user training and loan services on request, library management and software updates, and other activities.

Moreover, the laboratory provides so called remote analysis service for purpose of verification of results measured outside of the laboratory. The library matches and photographic evidence is simply forwarded to the laboratory which confirms the spectra measured and their interpretations. Only, in case of doubts the samples are sent to the laboratory for detailed analysis.

Other materials (not the part of the abstract):
CTL has created a website for use of customs officers specialized on mobile diagnostics within SINFICO project (System of Instruments for FIrst COntrol) - all information about mobile techniques used by Czech Customs are gathered on one place such as user instructions, shortened manuals, detailed manuals, safety information, examples of proper application etc.
In addition, CTL has created and maintains an Electronic Mobile Diagnostics Register, where individual instruments are recorded along with records of their inspections, technical specifications, verification and validation results, data on their operation and, for operators, records of their professional training.
A sample of training activities in this area is given in a separate presentation by @Rozkovcova et al.

D2pm-S2-2. Mobile diagnostics – teaching activity of Customs technical laboratory

B. Bažilová and **L. Rozkovcová**

Customs Technical Laboratory, General Directorate of Customs, Budějovická 7, Praha 4

CTL provides training in mobile diagnostics. Mainly we have certification course of mobile diagnostics. We started the training in June 2019. So far, we have got five rounds. Our course is official one – specialized training organized together with Education Institute of Customs administration which is responsible for organization issues. CTL is responsible for content, handheld devices, and examination of participants. The participants achieve the certificate, and we register them in the database of proficient instrument users. Each training is limited to about 15 trainees so that everyone can work with instrumentation. In total 32 training hours in 5 days. The training is held in the Training facility for Customs officers close to Prague. Practical training below means that the trainees get the unknown stuffs which must identify incl. the simulation of dangerous compounds. The main topics are as follows: Raman spectrometer, Infrared spectrometer, X-Ray spectrometer, field drug tests, itemizer, fumigation, cynology, HAZMAT suit. The topics are variable - because customs officers have different technologies and requirements. The most important are the practical trainings, where each operator tries everything.

D2pm-S2-3. Use of databases in the German Customs Laboratories

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Germany

The chemical characterisation can make a decisive contribution to the classification of various goods. Research options on the internet offer the possibility to obtain information about specific products and also chemical or physical data on the respective compounds or goods. For this purpose, searching online databases can be helpful. Relevant databases exist as free products as well as commercial services and are widely used for different tasks in German customs laboratories. They offer a wide range of information, usually grouped thematically. These can be, for example, collections of experimental data, such as IR spectra, or safety information on chemicals. In addition, some providers summarize a variety of information on certain chemical compounds, like their intended application, chemical analysis, synthesis, patent specifications, references to literature, etc. in a single database. Utilizing this information can be beneficial to plan appropriate chemical analysis and to characterise goods reliably.

D2pm-S2-4. Data management and sharing of spectra - conclusions of Pilot Study and elucidation trials

C. Guillou

European Commission, Joint Research Centre (JRC), 21027 Ispra, Italy

The administrative arrangement CLEN2SAND IV between DG TAXUD and the JRC is designed to provide scientific and technical support to the Customs Laboratories European Network (CLEN) in the field of identification and detection of new drugs. In this frame more than hundreds of samples from customs and forensic laboratories were analysed by the JRC since beginning of 2022. Among these the first analytical characterisation and/or identification of several New Psychoactive Substances can be mentioned:

-Fluetizolam (BE, FI), Desalkylgidazepam (FI) , CH-FUBBMPDORA (FR),
-ADMB-INACA (ADB-INACA) (BG), Hexahydrocannabiphorol (HHC-P) (SI)
-Ethyleneoxynitazene (Estonia)

The identification and analytical data of these substances were shared with the CLEN through communications in eCLEN in Sinapse and also with other networks and organisations such as the EMCDDA through shared folders in JRC-Box.
Besides the analytical support the JRC organised a series video-conference meetings aiming at establishing good practices for sharing of analytical data as well as consolidating knowledge in modern analytical techniques such as NMR:
-A CLEN Working Group was set up for Low Field NMR.
-Three CLEN virtual elucidation ring tests were organised through distribution of electronic
analytical data including, LF-NMR, high Resolution NMR, GC-MS and FT-IR data.
-Another Working Group (BE, BG, IT, JRC and EMCDDA) studied and established a workflow
allowing the sharing of GC-MS library based on the NIST MS tools.

Efficient and seamless sharing of electronic information is now common practice in many companies in the private sector and also more widely by the general public.
The current capability of sharing analytical data among CLEN laboratories, and other networks and organisation as experienced through the above-mentioned activities and exercises will be discussed. Organisational and technical difficulties encountered, as well as solutions that were set-up, will be commented. While a number of EC platforms and practices set-up by the JRC have allowed the collective work carried out in these exercises, it remains necessary to envisage a more longer-term analysis and reflection about this serious need of sharing analytical data within the CLEN laboratories. It is suggested that this topic could be highlighted as a necessity and be considered by the program of EU Digital Customs.

D2pm-S3-1. New perspectives on molecular biology: Customs labs among high complexity to face and great potential to exploit

C. Natale

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In the last two decades molecular biology has become a well-established reality in commodity field: DNA is used as a sort of "identity card", which contains precious information that is preserved during the entire goods life and is not damaged by processing techniques. The ability to read and interpret this natural genetic 'label' enables us to identify goods and check their purity. Molecular biology is still a young branch of science in constant and impressive development: Next Generation Sequencing (NGS) arrived on the market only ten years ago and now other equipment (Third Generation Sequencing) is on the way. The great potential of new technologies opens new possibilities, such as identification of all ingredients in complex mixtures, or detection of New Genomic Techniques (NGT) products but at the cost of a higher level of complexity to cope with. Huge amounts of data are produced, and high bioinformatics skill is required in order to handle, interpret and store them. Besides, in the prospective of an untargeted approach, there is a growing need of building reliable and shared databases for comparison and identification. These are the near future challenges that can only be won with open discussion and cooperation among biomolecular labs.

D2pm-S3-2. Endpoint PCR followed by gel visualisation as a simple and low cost technique for species identification

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Species identification by DNA has advantages over other methods: only limited amount (< 1 g) of sample is needed and treated (heated, dried, milled) samples can be analysed. Moreover, endpoint PCR followed with gel visualization is a very cheap and simple technique by which major animal and plant species can be identified.

Basic DNA analyses can already be performed using equipment with a purchase cost of less than 10000 euro (including a microcentrifuge, vortex, thermocycler, micropipette, gel electrophoresis system and a gel visualization system). The operational cost is also rather limited (typically < 20 euro per sample, excluding work) and include mainly reagents (reagents for DNA-extraction and purification, reagents for PCR reaction, and reagents needed for running the DNA samples on a gel).

This method is adequate for identification of well documented species (e.g. saffron vs safflower, squid species, etc.) and can be suitable for attribution of correct tariff codes. But It is (almost) impossible to differentiate between closely related species and less known species (e.g. CITES identification). More advanced and expensive DNA techniques may be suitable to identify these species. Luckily, over the last decades, sequencing costs have dropped significantly and cheaper sequencing techniques became commercialized.

D2pm-S3-3. New DNA sequencing techniques for species identification

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New DNA sequencing techniques allow fast and reliable species identification, especially in complex mixtures. The present lecture will focus on metabarcoding with Nanopore sequencing device. Our laboratory validated this method on various types of animal and vegetal samples such as meat mixes, seafood, frozen fish blocks or plant-based traditional medicine. Results showed that this technique is very promising and may be useful for different applications such as fighting illegal fishing and endangered species traffic. Highlights on some practical examples will be shown during this lecture.

D2pm-S3-4. Searching for dactyloscopic and DNA fingerprints at German Customs Labs

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Because of increasing case numbers at Customs Investigation Services the establishment of forensic fingerprint and DNA laboratories at German Customs labs was necessary. The task was the visualization and documentation of fingerprints and the securing of DNA evidences.

The Kick-Off of this project was at the beginning of 2015. At this point the project road map including milestones was created and due to the order of the Federal Ministry of Finance in 2016 some labs in the existing buildings of German Customs labs could be upgraded and equipped for the new tasks. While labs were being converted, the lab staff has been trained for the new field of the forensic science at the Bundeskriminalamt respectively the Federal Police and at the local State Criminal Police Offices.

The Customs Labs in Berlin, Munich – Markt Schwaben and Cologne started in 2018 with the handling of real cases of the Customs Investigation services. Hamburg has been searching for dactyloscopic and DNA fingerprints since July 2020. An overview about this project using the example of the German Customs lab in Hamburg regarding development, procedure and results will be presented.

D2pm-P-1. ILIADe: celebrating 25 years of successful co-operation and wishes for the future

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ILIADe is the shared database of analytical methods developed and used within the CLEN community. This lecture briefly runs through the past history of the database celebrating the 25TH Anniversary of its first creation. Some of the most interesting characteristics of the database are shown, together with the covered topics and some examples of methods. Finally, the latest developments are shown, including the public interface within the Commission's website.

The concept of CLEN methods is clearly stated as well as their use in everyday routine of European customs laboratories. The development of a CLEN method responds to a common problem and therefore follows a choral approach. During the development, several CLEN actions and many European customs laboratories work together, up to the final revision of the text and its insertion in the ILIADe database together with the documents that are foreseen for the development and maintenance of each single method (legal basis, results by proficiency test circuits...).

D2pm-P-2. Czech Customs Laboratory celebrates 100 years

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Based on Government Decree No. 141/1923 of 12 July 1923, the Chemical-Technical Testing Laboratory of the Czechoslovak Financial Administration was established in Prague, which is the predecessor of the current Customs Technical Laboratory (CTL). The task of this testing laboratory was to carry out analytical and microscopic analyses, testing, re-testing and examination of raw materials, products, and goods of all kinds in the field of financial administration on the orders of the Ministry of Finance or at the request of authorities and individuals. This laboratory submitted expert reports to the Ministry of Finance and other authorities in accordance with the rules issued by the Ministry of Finance. In carrying out analyses and submitting expert opinions, the testing laboratory acted completely independently.

A brief overview of the journey from this first customs laboratory established in 1923 to the present customs laboratory will be presented in the form of a lecture followed by a short video.

D3am-P-1. **Drugs: doping substances**

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The initial scope of the administrative arrangement CLEN2SAND IV between DG TAXUD and the JRC was mainly about the identification of New Psychoactive Substances (NPS).
Several other categories of substances are also present in the samples sent by the CLEN for identification by the JRC. Many of these were found to be doping substances of the Prohibited List of the World-Anti-Doping-Agency (WADA). Among them are frequently found Selective-Androgen-Receptor-Modulators (SARMs) such Andarine, Cardarine, RAD140, Ibutamoren and others. Many of these cannot be detected by routine GC-MS analysis.
Moreover, many samples seized by Customs authorities are preparations in PEG which, in some cases, may also be problematic for analysis by LC-MS.
In the JRC we have developed a quick approach of identification by HR-NMR which can confirm the identification of such SARMS in a few minutes. The NMR spectra of these substances have been fully interpreted and we have established a library of NMR fingerprints in our database which can also be used for detection using Low Field NMR.
The detection by Low Field NMR has been tested on a few samples and showed positive results. It is now being investigated using several Low Field NMR instruments on a collection of SARMS samples in PEG.
In a near future this method could be used in routine by many CLEN laboratories.

D3am-P-2. Designer-precursors for drugs: a challenge for Customs Chemists and Forensic Scientists

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Europe in general, and Belgium and the Netherlands in particular, are significant producers of (meth)amphetamine and MDMA [1]. A logical way to stop the production of these illicit drugs is to prevent the criminals from getting their hands on the essential ingredient namely the drug precursor.

Both the Customs laboratories as well as the Forensic Institutes are involved in this fight against drug precursors, although with a different role. The Customs Laboratory aims at identifying drug precursors and pre-precursors in imported goods, whereas the Forensic Institute is confronted with those substances when dismantling illegal drug labs and dump sites.

The first part of the presentation gives insight in the problem from a customs' perspective. Several questions are raised and answered:

- What substances are encountered over the last years and how do changes in legislation affect this list?
- How can the Customs Laboratory support customs officers to identify these substances right at the border?
- What analytical techniques can be used for this purpose, both at the border as in the laboratory?

The second part of the presentation summarizes the findings of the Forensic Institute:

- Which substances are detected in illicit labs versus dump sites?
- What is the physical appearance of these substances: powder versus paste versus liquid?
- How are these substances packed and labeled?

References

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D3am-P-3. Towards strengthened preparedness and response to new psychoactive substances in Europe

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In January 2022, the European Commission proposed to strengthen the mandate of the EMCDDA, transforming it into the new EU Drugs Agency (EUDA) [1]. This new regulation aims to improve data sharing, preparedness, surveillance, risk assessment, early warning, prevention, and response [2].

Under this regulation, a new network of forensic and toxicological laboratories will be established and operated by the EUDA. The network will bring together national laboratories, including from the Customs Laboratories European Network, generate data and information exchange on new developments and trends, organise training to enhance the competence of forensic drug experts, support the implementation of quality assurance schemes, and support the further harmonisation of data collection and analytical methods.

This presentation will provide an update from the European Union Early Warning System (EWS) on new psychoactive substances (NPS) and highlight emerging threats. Operated by the EMCDDA, the EWS was the first regional early-warning mechanism set up more than 25 years ago [3] to monitor and respond to NPS. The EWS ensures that the EU and its Member States have state-of-the-art information on NPS and the threats they pose to Europe to protect public health and inform policymaking.

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[3] https://www.emcdda.europa.eu/publications/rapid-communication/update-eu-early-warning-system-2022_en

D3am-S1-1. Workflow of unknown samples in Customs Technical Laboratory (CTL), Czech Republic

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The presentation describes the practice used in the Customs Technical Laboratory (CTL) when handling unknown and dangerous samples. The entire flow chain from transport to the laboratory, through primary screening to analysis of hazardous chemicals was shown. It was emphasized that high attention is paid to the safety of officials, laboratory staff and the environment.

The approach of the Customs Laboratory of the Czech Republic - the use of special personal protective equipment (PPE), dedicated rooms for opening shipments and the method of training of staff both in the laboratory and in the field would be presented. Emphasis on the use of mobile diagnostics and first aid will also be mentioned.

D3am-S1-2. Structure elucidation and unambiguous identification of new substances – experiences from proficiency tests

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A wide range of new psychoactive substances (NPSs) has appeared in the illicit market of many European countries since 2008. The identification of these new molecules was a challenge even if the laboratory has some analytical data from various sources. Moreover, the structure elucidation of a new substance without any reference data is still a completely new task for many forensic laboratories. Both situations have relevant risk of misidentification due to similar analytical characteristics of isomeric substances.

The identification capabilities of forensic laboratories can be assessed in proficiency tests or collaborative exercises focusing on the identification of NPSs. The proficiency test organised by the Drugs Working Group of the European Network of Forensic Science Institutes (ENFSI DWG) has contained known NPSs for many years . The evaluation of incorrect qualitative results of these samples highlights the pitfalls of the methods applied and indicates the essential need for the combination of various techniques in the analysis of street samples.

The ENFSI DWG started a new type of Collaborative Exercise for structure elucidation as an extension of the proficiency test in 2016. In this Structure Elucidation Trial, the organiser designs and synthetizes a new molecule which mimics structural features of NPSs and the participating laboratories have to determine its structure. Five rounds of collaborative exercises has already been organised for the participants of ENFSI DWG proficiency test, including one round in cooperation with European customs laboratories and one pilot round in cooperation with the UNODC International Collaborative Exercise. The results of these exercises prove that the correct identification requires appropriate analytical scheme and experience in structure elucidation. The analytical strategies applied by those participants who reported correct results can be considered as good practices.

Information from the proficiency tests and collaborative exercises can be used for planning the analytical scheme of NPS/drug analysis to obtain robust workflow for the unambiguous identification and structure elucidation.

D3am-S1-3. Cannabis products - results of the CLEN ring test

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Due to a huge increase of cannabis-based products on the market, the organisation of a CLEN inter-laboratory test on cannabinoids was first proposed for the year 2021 during the 22nd CLEN Plenary Meeting held in February 2020, and then confirmed during the CLEN webinar on cannabinoids held in October 2020. This was the first ring test carried out on this topic, possibly on products classified as narcotics, within the framework of CLEN Action 2 activities.

The main goal of this ring test was to train, test and evaluate the performances of the Customs Laboratories on three different products - dried plants, CBD oils and cookies - for the main analyses of interest, especially on the identification and quantification of Δ9-tetrahydrocannabinol (Δ9-THC) and cannabidiol (CBD) and to compare different analytical methods (GC-FID, GC-MS, HPLC-UV/DAD, LC-HRMS and NMR).

The manufacture of the samples was entrusted to the University of Chemistry and Technology of Prague (UCT Prague).

An unexpected delay in the delivery of the samples and difficulties in collecting the import-export permits necessary to receive samples containing psychotropic substances led to postpone the launch this test until February 2022.

Of the 50 laboratories registered for this test, 49 have returned some results: 37 Customs Laboratories (of the Customs Programme participating countries), one third country Customs Laboratory, 7 Forensic laboratories of the EU member states and 4 European laboratories belonging to universities.

The results were good despite the diversity of matrices, especially with complex products such as cookies.

The main results obtained on the different samples will be presented for different cannabinoids in their different forms (neutral, acid or total), especially total Δ9-THC and total CBD, with comparisons of the different techniques used.

Despite the difficulties experienced in the sending of samples and in understanding the countries authorisation mechanisms, this ring test was a real success considered very useful for Customs Laboratories who are interested in a future test, always with the flower powder, but also with other edible matrices.

For CLEN people, the final report is available on SINAPSE **Access the Document**

D3am-S1-4. Hexahydrocannabinol seizures in Cyprus Customs

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Hexahydrocannabinol (HHC) is a hydrogenated derivative of tetrahydrocannabinol. It has been identified as a trace component in Cannabis, since it is a naturally occurring phytocannabinoid. HHC is the first semi-synthetic cannabinoid reported in the EU and has been monitored as a NPS by the EU Early Warning System since 21 October 2022. HHC can be made from Cannabidiol (CBD) extracted from low-THC cannabis, unlike synthetic cannabinoids found in Spice-type products. A small number of laboratory studies reveals that HHC has similar effects to Tetrahydrocannabinol (THC), the main psychoactive substance in cannabis. Likewise, consumers indicate that its effects might be similar to that of cannabis, although the effects of HHC in humans have not been studied [1]. HHC is not controlled under the Cyprus Narcotic Drugs and Psychotropic Substances Law N.29/1977.

A range of branded and unbranded products containing HHC are nowadays available in Europe. At the end of 2022, Cyprus Customs confiscated food products, vape pens and low-THC cannabis hemp flowers which were labelled of containing HHC. The analysis of the seizures was taken place in the Forensic and Toxicology Department of the State General Laboratory of Cyprus, which indicated the presence of HHC among other cannabinoids : CBD, Cannabigerol, Δ^8-THC, Δ^9-THC, Cannabinol. The combination of the cannabinoids was not the same in all products, probably because of the different route of HHC production or the addition of HHC on different kinds of low THC-cannabis hemp flowers.

In this poster, the method of analysis, including extraction and instrument parameters, as well as the analytical results of the products will be presented.

References

[1] https://www.emcdda.europa.eu/

D3am-S1-5. On the route to legalisation - Hemp products in Czech Customs Technical Laboratory

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Social and political demand is evolving towards partial legalisation of hemp and associated products. The recreational use of cannabis is linked to the black market. Legalisation of these products may be beneficial due to improved product quality, tax collection and weakening the organised crime.

This overview focuses on the current state of analytical approach to hemp products in CTL. Qualitative and quantitative analysis is performed by using combination of chromatographic methods (LC/MS, GC/FID). Quantitative Nuclear magnetic resonance (qNMR) is an interesting option that is used for analysis of soluble hemp products such as isolates and distillates.

According to current trends the presentation will also touch the problematics of novel semi-synthetic cannabinoids (HHC, THCP, THC-O)

Keywords: Hemp, cannabinoids, legal status, LC/MS, NMR

D3am-S2-1. The rise of new tobacco products in Hungary

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In accordance with Directive 2014/40/EU, menthol-flavored cigarettes and menthol-flavored cigarette tobacco, as well as electronic cigarettes, refill bottles, and electronic devices imitating smoking with tobacco, menthol, and fruit flavors may not be placed on the market in Hungary from May 20, 2022.

This is why new types of flavored tobacco products, such as disposable electronic cigarettes and tobacco-free heating products, have spread especially among young people.

In Hungary, flavored disposable electronic cigarettes can only be purchased from illegal sources, which includes the dangers of fake products with unknown composition.

In the last year and a half, our laboratories have seen an increase in the number of new types of tobacco product samples, such as disposable electronic cigarettes or tobacco-free heating products, as well as refill liquids called food flavorings.

In my presentation, I would like to present the questions and experiences arising during the analytical examination, tariff and tax classification of new tobacco products.

D3am-S2-2. Chemical characterisation of illicit tobacco products: determination of geographical origin and links among tobacco seizures across the EU

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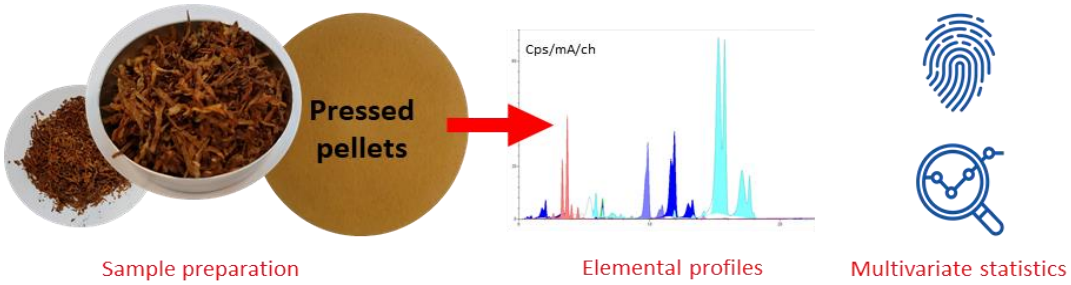
Illicit cigarettes trade causes billions of Euros of tax revenue losses to the European Union budget every year. The Joint Research Centre (JRC) in Geel, Belgium, in the frame of the implementation of Commission Communication 'Stepping up the fight against cigarette smuggling and other forms of illicit trade in tobacco products - a comprehensive EU strategy' (COM(2013) 324 final) has set up TOBLAB, a testing facility for the chemical characterisation of tobacco products. TOBLAB provides support to Member States and DG OLAF in identifying the geographical origin of cigarettes seized by customs authorities and in finding links among tobacco seizures across the EU. Energy Dispersive X-Ray Fluorescence Spectroscopy (ED-XRF) is a high throughput technique that requires minimal sample preparation used by the JRC to quantify the mass fraction of 35 elements in tobacco. Since 2016, the JRC has built a repository of 900 reference cigarette samples purchased at licensed tobacco stores around the world. In this study, the results of the application of the ED-XRF method to the analysis of reference and illicit cigarettes are reported. The elemental profiles were analysed with multivariate statistical techniques such as Principal Component Analysis (PCA), Soft Independent Modelling of Class Analogies (SIMCA) and Partial Least Squares Discriminant Analysis (PLS-DA). The potential of Python-based machine learning algorithms has also been explored. The multivariate models provide useful information to discriminate cigarettes produced outside the EU from the European samples, differentiate cigarette brands and flag counterfeit products.



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D3am-S3-1. Applications of High Resolution Mass Spectrometry – Identification of species of origin of wood and protein samples

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In the Dutch Customs-laboratory, UPLC-HRMS techniques are explored to identify the origin of wood and protein samples to the species-level. For wooden objects the relevance is the control of protected CITES-wood species, while for proteins GN code classification is the driver.

Our hardware consists of a Vanquish UPLC linked to a Q Exactive Orbitrap mass spectrometer. This instrument enables High Resolution Accurate Mass measurements that provides very specific information [1] from which the elemental composition of analytes can be derived. High-energy collision dissociation (HCD) MS2 experiments give information-rich fragmentation spectra for library matching. And the chromatographic pre-separation allows retention time matching for an additional information dimension.

Many CITES-wood specimen contain abundant species-specific secondary metabolites that are readily extracted with methanol [2]. One example of UPLC-HRMS analysis of wooden statues shows a perfect match with *Dalbergia melanoxylon* reference sample from our xylarium. Protein samples are converted into tryptic digests and their UPLC-HRMSMS data is analysed by Proteome Discoverer software. Samples of soy, wheat, broad bean, pea, rice, and various milk-derived proteins could were all assigned to the correct species of origin.

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D3am-S3-2. Analytical parameters and tests applicable for proving chemical and physical modifications of shortenings

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Over the last few years an increased number of samples of vegetable fats and oils have been registered in Central Customs Laboratory (CCL) in Bulgaria. The majority is palm oil and its products, declared in Chapter 15, headings 1511, 1516 and 1517. As technologies for palm products processing get more advanced, an expansion of our expertise and developing of new analytical methods were necessary in order to define the correct sample identification and tariff classification.

Some of the most interesting samples of vegetable oils that are registered in CCL and the challenges arising from their identification and tariff classification are proposed.

This presentation aims to demonstrate the approach of the CCL experts in the analysis of vegetable and animal oils/fats and especially palm shortenings. Methods for proving chemical and physical modification are discussed. Differentiation of textured from non-textured palm oil by visual evaluation and consistency via penetrometer method AOCS 16-60 and an in-house method for qualitative determination of sorbitan emulsifiers in vegetable fats and oils are presented.

D3am-S3-3. Multi-step dry fractionation of palm oil

B. Pinelopi

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Vegetable fats are heterogenous in composition, containing different fatty acid compositions. Each triglyceride exhibits unique chemical properties, among them melting temperature, that depend on the size and degree of unsaturation of these fatty acids and their position on the glycerol backbone. Physical fractionation takes advantage of these differences in chemical behaviour to isolate specialty subfractions with desirable compositions and performance properties.

Palm oil is fractionated more than any other oil. The triglycerides of palm oil consist of a combination of fatty acids with different chain length as well as degrees of unsaturation. This results in the presence of substantial quantity of both low- and high-melting triglycerides stearin and olein, which are classified in a different tariff code.

This presentation is a general view of fractionation, different steps and production of materials who have a wide range of food and non-food uses and extend considerably the use of palm oil.

D3am-S3-4. Ballistic plates: from novel materials to bulletproof tariff classification

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As the fight against terrorism and other malicious threats continues fiercely in the homeland and border protection, development of new technologies and novel materials is of utmost importance to gain the upper hand over the adversaries. Collaterally, the long history of producing wearable materials which are able to protect a person from a projectile has shown a great deal of progress especially over the last decades as a result of the advancements in the field of materials science and engineering. This, in turn, has allowed the availability of a variety of ballistic protection vests (aka bulletproof vests) with ballistic plates made of various materials such as plastics, ceramics, woven goods and their combinations.

Import and export transactions as regards bulletproof vests and ballistic plates and thus their tariff classification are therefore an important matter from the perspective of the Customs as well as the associated Laboratories. This presentation aims to briefly overview the state-of-the-art in the field of ballistic protection, and to address the issues concerning the tariff classification of ballistic plates.

D3am-S3-5. Cast Iron – a versatile material

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Cast iron is a material with a wide spectrum of use in different goods. Depending on the chemical composition and treatment of the material during the casting process different types of cast iron can be obtained. These different types have different mechanical properties which broadens the use of the material even further. Due to the difference in mechanical properties some cast iron types are used for certain goods.

Cast Iron is widely used as material for manhole covers and pipe connecting parts. The goods are classified under the tariff positions 7307 and 7325. Within these positions it is necessary to distinguish between the different types of cast iron in order to find the correct sub headings and TARIC-Codes.

The German customs lab use various analytical methods and an established workflow to identify the different cast iron types and find the correct tariff codes. The presentation will show the experiences and analytical challenges in analysing these types of samples.

D3pm-P-1. Satellite Laboratories at the Front Line: The Canadian Approach to Narcotics Detection within high volume Postal and Air Cargo Facilities

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In 2022, there were over 100 thousand seizures by the Canada Border Services Agency (CBSA), including illicit drugs, firearms and weapons. These seizures were a small portion amongst legal and legitimate goods crossing the border. In this same time period, CBSA Border Services Officers also processed over 130 million courier shipments, 23.76 million travellers, and 21.8 million commercial releases. Results from chemical analysis serve as one of a multitude of tools Border Services Officers use to make an admissibility decision.

The CBSA recently introduced a new program, the Designated Safe Sampling Areas (DSSA), which provides on-site chemical analysis by chemists at ports of entry in Canada. The DSSA encompasses engineering and administrative controls for safe sampling and analysis of suspected contraband. The chemical knowledge and expertise from chemists add a valuable component to the day-to-day border services investigations. Since the inception of the program in 2020, the DSSA has assisted in seizures of numerous new drug analogues, such as metonitazene, 1V-LSD and putylone. The DSSA has also allowed rapid identification of non-controlled and non-scheduled substances, in turn facilitating the free flow of legitimate goods.

This presentation will give an overview of the DSSA, instrumentation used, highlights of seized illicit drugs, challenges and lessons learned.

D3pm-P-2. Overview of U.S. Customs & Border Protection Laboratories

S. Cassata

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A brief overview of the CBP Laboratory System. The presentation will cover system role and structure, including laboratory facility locations, scientific and forensic capabilities, staffing and budget.

D3pm-P-2. Overview of U.S. Customs & Border Protection Laboratories and Scientific Services Rapid Testing Assessment (RTA) Program

S. Cassata[1]; D. Montero[2]; N. Borga[2]; G. Gratacos[2]; C. Mocella[3]

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An overview of the CBP Laboratories and Scientific Services (LSS) Rapid Testing Assessment (RTA) Program. The program is designed to provide an assessment of commercial off the shelf (COTS) or government off the shelf (GOTS) technologies and instrumentation. The term "Rapid" is used to indicate that this is not a full evaluation, but a quick assessment of instruments' capabilities and operation. This provides leadership and procurement officials with information pre-decisional information on whether a particular instrument or technology is suitable in the customs environment.

D3pm-P-3. Analysis of chemical precursors used in the manufacture of illicit drugs - analysis of solvents by gas chromatography.

J. Chavez Almora, **W.Tello**

Central Laboratory-SUNAT-PERU

In Peru, through Supreme Decree No. 268-2019-EF, the list of 33 chemical precursors used in the production of illicit drugs was updated, which are subject to registration, control, and surveillance in the national territory (see Annex 1). For the analysis of the 10 precursors of the organic solvent type (ethyl acetate, n-propyl acetate, acetone, benzene, ethyl ether, hexane, methyl ethyl ketone, methyl isobutyl ketone, toluene, and xylene), the Central Laboratory of SUNAT has developed its own assay methods.

First, a qualitative analysis [1] is carried out using gas chromatography with mass spectrometry detection to identify the precursors present in the sample by comparison with the NIST Mass Spectral Library. Next, the quantitative analysis [2] is carried out by means of gas chromatography with flame ionization detection, using calibration curves in the range of 2%–20% (w/w).

For the analysis, the Agilent technology system was used, comprising a 7890B gas chromatograph, a 5977B MSD mass spectrometer, a 7697A headspace sampler, and a flame ionization detector (FID).

Annex 1: Precursors and goods subject to registration, control, and supervision.

N°	Precursors and Goods	Chemical formula
1	Ethyl acetate	$C_4H_8O_2$
2	n-Propyl acetate	$C_5H_{10}O_2$
3	Acetone	C_3H_6O
4	Anthranilic acid	$C_7H_7NO_2$
5	Hydrochloric acid and/or Muriatic	HCl
6	Formic acid	CH_2O_2
7	Nitric acid	HNO_3
8	Sulfuric acid	H_2SO_4
9	Ammonia	NH_3
10	Acetic anhydride	$C_4H_6O_3$
11	Benzene	C_6H_6
12	Sodium Carbonate	Na_2CO_3
13	Potassium carbonate	K_2CO_3
14	Ammonium chloride	NH4Cl
15	Ethyl ether	$C_4H_{10}O$
16	Hexane	C_6H_{14}
17	Calcium hydroxide	$Ca(OH)_2$

N°	Precursors and Goods	Chemical formula
18	Sodium Hypochlorite	NaClO
19	Isosafrole	$(CH_2OO)C_6H_3(CH=CHCH_3)$
20	Kerosene	---
21	Methyl Ethyl Ketone	C_4H_8O
22	Methyl isobutyl ketone	$C_6H_{12}O$
23	Calcium oxide	CaO
24	Potassium permanganate	$KMnO_4$
25	Piperonal	$C_8H_6O_3$
26	Safrole	$CH_2OO(C_6H_3)CH_2CH=CH_2$
27	Sodium sulfate	Na_2SO_4
28	Toluene	C_7H_8
29	Xylene	C_8H_{10}
30	Sulfamic acid	HSO_3NH_2
31	Calcium chloride	$CaCl_2$
32	Sodium hydroxide	NaOH
33	Sodium metabisulfite	$Na_2S_2O_5$

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[1] Qualitative determination of organic solvent-type precursors by gas chromatography with mass spectrometry detection (GC-MS) LAB-ME.09.01 method. Central Laboratory-SUNAT.

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D3pm-P-4. The Challenges faced in Papua New Guinea Customs Laboratory as a Developing Nation

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PNG Customs Service continues to perform its traditional role of Border Protection, Trade Facilitation and Revenue Collection as mandated by the Customs Act and related laws. Through its border protection and enforcement roles, it ensures legitimate trades are facilitated and appropriate State revenues accruing from the trade are collected. It also imposes and collects revenues in respect of the production and sale of excise products pursuant to the Excise Act.

The substantial challenges exerted by the increasing movement of goods, conveyances and people across the border, the border security function was performed with aid of the Container X-Ray Examination Facility aimed at enhancing PNG Customs' role in ensuring supply chain security and promoting efficient trade facilitation. Whereby the Harmonized System Convention and Revised Kyoto Convention entered into force in Papua New Guinea on 1 January 2014 and 30 April 2014 respectively as well as the implementation of the WTO Agreement on Trade Facilitation accepted in Bali (Indonesia) on 7 December 2013. The Advanced Tariff Ruling Scheme has proven very effective for PNG Customs in the delivery of its role of trade facilitation as well the implementation of the automated system of cargo clearance called the ASYCUDA.

PNG Customs keeps information about merchandise trade in its ASYCUDA database. As required by law, import and export data, import and export data is declared to customs by the trading community. The accuracy of the declaration is supported through Customs compliance and post clearance audits.

Records showed that Australia continued to be PNG's most important two way trading partner in both import and export goods. PNG featured prominently in the volume of its import while Japan recorded a high export from PNG while top export destinations were Japan, Australia and China. Most imports were originated from PNG, Australia and Singapore. Imports of crude oil are mainly PNG origin. The crude is extracted from PNG, exported overseas and imported back to PNG through international market transaction process. PNG mainly imports Chemicals, crude oil, aeroplane parts, rice, vehicles, heavy machinery, meat, iron and steel. PNG's main trading partners for imports are from Asia Pacific region. Since 2008, there has been a marked increase of the relative value of imports to PNG from Japan and China, with the value from these countries more than doubling.

With the increase in trade volumes coming in from the Asia Pacific Region it poses a high risk of big amounts of counterfeit goods coming into the country. The major challenges currently faced with is the use of technology. The PNG Customs laboratory only uses the portable devices to carry out analysis and engage external agencies to carry out other analysis with longer than expected turnaround time. The technology currently being used at the ports and borders are; Ionscans, First Defender, Biosens, Gemini and X-rays.

Funding has been the number one challenge in sourcing and modernizing the Customs Lab in the country to bridge the gap of Border Protection and Revenue collection and as per the administrations roadmap in which they are working towards achieving that.

The country has seen an increase in use of low-quality and fraudulent foodstuff and beverages with recent alcohol poisoning involving the use of methanol and cheap alcohol. The abuse is also on the rise with the use of Methamphetamines with the recent seize and apprehension of illegal sale of Methamphetamine drugs and discovery drug manufacturing in the country. It poses a big threat to the national security with the country becoming a transit and manufacturing hub of this deadly drug putting the society's lives at risk.

The 8th Seminar of European Customs Chemists under CLEN Action 4 proves to be and important scientific and technical communication for a Customs Lab in a developing nation to learn from and at the same time greatly assist in capacity building as it is lacking in PNG Customs Laboratory thus will greatly contribute towards modernizing the Customs Laboratory in Papua New Guinea.

D3pm-P-5. Introduction to Korea Central Customs Laboratory

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Korea Customs Service has 6 Customs laboratories over the nation. The number of staffs doing experimental job for HS classification as Customs officer in Korea is approximately 100. Korea Central Customs Laboratory(CCL) is one of 6 Labs. Representing other 5 Korea Local Customs Laboratories(LCL), CCL plays the key role in HS classification and experimental analysis of imported or exported trading goods and illegal drugs from other countries. At the same time, it has accumulated and conserved a lot of data of the customs analysis over 60 years. Also, Korea CCL has done many activities for International Cooperation participating in various WCO meetings and exchanging information with foreign customs laboratories. For the example, Korea CCL was appointed to RCL (Regional Customs Laboratory) from WCO and it has own goal for improving the accuracy and effectiveness of the customs analysis and encouraging the cooperation and networking among customs laboratories of WCO members countries.

D3pm-P-6. The Organization for the Prohibition of Chemical Weapons and Customs working together for preventing the re-emergence of chemical weapons

M. de Rienzo

Organisation for the Prohibition of Chemical Weapons (OPCW), The Netherlands.

The Organisation for the Prohibition of Chemical Weapons (OPCW) is the implementing body for the Chemical Weapons Convention (CWC), which entered into force on 29 April 1997. The OPCW, with its 193 Member States, oversees the global endeavour to permanently and verifiably eliminate chemical weapons and since its entry into force, it is the most successful disarmament treaty in the world.

Today, over 99% of declared stockpiles of chemical warfare agents have been verifiably destroyed. Production facilities have either been destroyed or converted for peaceful purposes. By 2023, the full elimination of declared stockpiles is expected.

Despite OPCW's efforts in eliminating declared chemical weapon stockpiles, chemical weapons may re-emerge in a number of ways: through state-sponsored programmes, through the actions of terrorist or other criminal groups, or through lone individuals. The OPCW works in a variety of ways to prevent these scenarios from happening.

Customs is in the frontline to protect our borders from the illegal entry of toxic chemicals and precursors and plays a crucial role in preventing the diversion of chemicals for purposes prohibited under the Convention. The International cooperation and assistance division of the OPCW organises specialized trainings for customs authorities and customs laboratories for Member States, whose economies are developing or in transition, aimed at controlling the trade in dual use chemicals relevant to the CWC and at identifying analytical chemical weapons related chemicals.

D3pm-P-7. Cooperation OMCL Network – CLEN

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The collaboration between the OMCL Network and the Customs Laboratories European Network (CLEN) started in 2014 and since then there have been several exchanges on the occasion of meetings, seminars or training courses organised by one or the other network. In addition, two joint meetings OMCL Network - CLEN have been organised, in 2020 and 2022, to introduce the respective activities of each network, identify common areas of interest and better coordinate the collaboration between them.

OMCL laboratories are mainly focused on the testing of legal medicines for compliance with predefined product specifications, while Customs are more often confronted to analysis of unknown samples which turn out to be medicinal products. However, despite the differences in the areas of activity and related working methods, there are common grounds for collaboration due to the interest of both laboratories in revealing adulterations and illicit use of medicines.

A common key principle for both Networks is the work-sharing. For this purpose, both networks have developed ways to allow laboratories with specific technical competencies to perform tests on behalf of other network members.

Several areas of potential collaboration have already been identified such as running common PTs or ring trials or organising common training courses in specific analytical techniques.

D3pm-P-8. The Customs Laboratories Expert Team

A. Proposito

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The CLET (Customs Laboratory Expert Team) is a CLEN project structured into four work packages (WP) launched at the beginning of 2017 and the second edition (CLET-2) ended on 29 October 2021.

The third edition (CLET-3) started on 1 December 2021 for a duration of 36 months.

It is intended to strengthen and improve operational co-operation by pooling expertise and equipment and by sharing analytical results at EU level. This initiative aims to focus on the skills and technical equipment within the CLEN and to share the results of the analyses on a common platform, in order to develop a harmonised operational approach to chemical analysis and to promote new working methods.

In case a laboratory does not have the equipment or expertise to make a particular analysis, the samples can be sent to another laboratory which will be partially reimbursed for its support.

The Expert Team is coordinated by Italy and gathers 9 other partners besides Italy: Belgium, Cyprus, Czechia, Finland, France, Greece, Hungary, Netherlands and Spain.

In this presentation the operational results during 2023 will be showed.

D3pm-P-9. Customs Control Equipment Instrument (CCEI) current state and achievements

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The Customs Control Equipment Instrument (CCEI), a new EU programme, supports the Customs Union and customs authorities in their mission to protect the financial and economic interests of the Union and its Member States, to ensure security and safety within the Union and to protect the Union from illegal trade while facilitating legitimate business activity [1]. The specific objective of the CCEI is to contribute to adequate and equivalent results of customs controls, thereby helping the customs authorities act as one to protect the interests of the Union. This will be achieved through the transparent purchase, maintenance and upgrading of relevant and reliable state-of-the-art customs control equipment that is secure, safe and environmental-friendly.

The CCEI budget for the period 2021-2027 amounts to EUR 1.006 billion [2].

The presentation will give an overview of the working arrangements and the data driven approach that is used in the CCEI. The outcomes and results of the first call 2021-2022, with a main focus on the EU Member State customs laboratories, will be presented.

References

[1] https://taxation-customs.ec.europa.eu/eu-funding-customs-and-tax/customs-control-equipment-instrument_en

[2] Regulation (EU) 2021/1077 of the European Parliament and of the Council of 24 June 2021 establishing, as part of the Integrated Border Management Fund, the instrument for financial support for customs control equipment. Available at: https://eur-lex.europa.eu/eli/reg/2021/1077/oj