AOAC INTERNATIONAL
Sub-Saharan Africa Section

Association of Analytical Communities
Sub-Saharan Africa Section Annual Meeting

Harmonizing of Testing Standards: critical to free trade of safe food in Africa

5-8 November 2019
NH The Lord Charles Hotel, Somerset West,
Cape Town, South Africa

PROGRAMME

Words of Welcome
President, AOAC-SSA Section

Exactly one year ago, we gathered in Pretoria to launch the AOAC Sub-Saharan Africa Section. During this inaugural meeting, we outlined our objectives for 2019 and set the direction for the development of our organisation. We are pleased to report that despite the numerous challenges, we have been able to achieve much of what was planned. Our membership continues to grow; we have been able to secure more benefits for our members; we are engaging with our partners and stakeholders in ways that advances our mission to use our collective knowledge and expertise to contribute to the improvement in the quality of testing and building confidence in analytical results, both of which has a direct impact on trade and public health within our region.

Many great things are happening in our continent. The AU/FAO/WHO commitments on food safety at the first AU/FAO/WHO International Food Safety Conference that was held in Addis Ababa; the AU's intention in creating an Africa Food Safety Agency; the implementation of the Africa Food Safety Index and the ratification of the African Continental Free Trade Area, are among the many positive developments. This is likely to translate into increase in intra-Africa trade of traditional and non-traditional food commodities, increased regulations and increases in testing required to assess and enforce compliance. The need to develop our testing infrastructure, align on what analytical methods are fit-for-purpose and the harmonisation of testing standards to facilitate universal acceptance of analytical results regionally and internationally are therefore critically important.

The theme of our 2nd meeting, '*Harmonisation of Testing Standards: critical to the free trade of safe foods in Africa*', speaks directly to the current challenges with testing the wide diversity of foods traded and consumed within our region. Our programme focuses attention on building on the fundamentals of testing, analytical methods alignment and harmonisation as well as delves into some present and emerging food safety issues in order to identify some of our most critical analytical methods development needs for our region. Additionally, we will be launching two key initiatives, the Young Scientists Development Programme and the Laboratory Mentorship programme, both focused on building capacity and improving performance in testing.

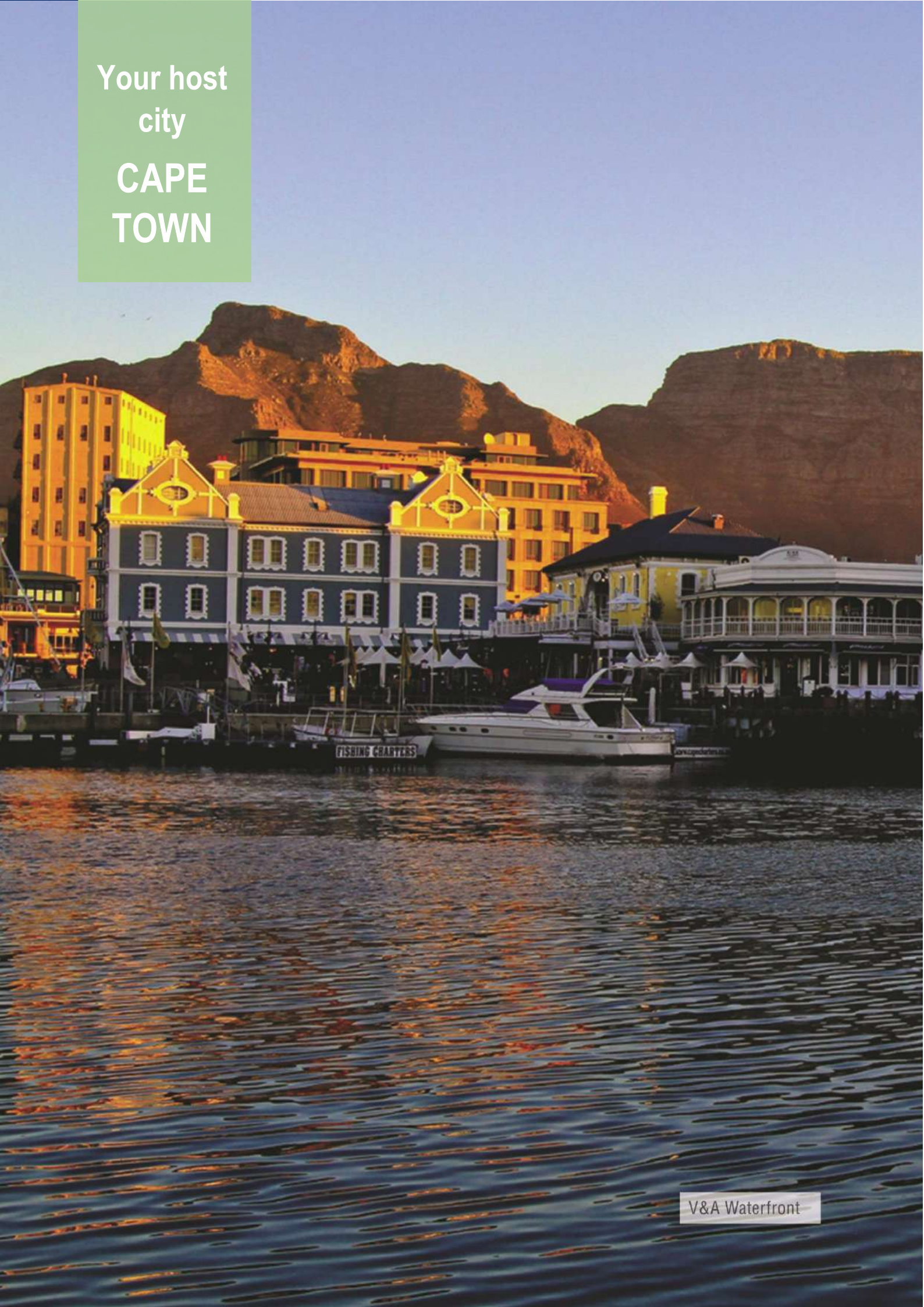
Our annual Section meeting serves to celebrate our achievements during the past year; share our learnings and challenges, while at the same time identifying new opportunities, engaging our stakeholders and strengthening our partnerships. This process will give us what we need to define our priorities for 2020 and to set out our roadmap for the years that follow.

In closing, I would like to thank our Partners and Sponsors whom have contributed generously to our Section. I would also like to thank our Executive Committee, our Board of Directors, our Members, the Speakers, the Delegates and everyone else that has contributed to making this meeting a success. I know that with your energy and commitment, we can accomplish much at this meeting. I am eagerly looking forward to meeting you all and wish you a safe and pleasant journey to Cape Town.

Owen P. Fraser, PhD
President, AOAC INTERNATIONAL Sub-Saharan Africa Section

Your host city

CAPE TOWN



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Sustainability and Corporate Social Responsibility

The AOAC Sub-Saharan Africa Section subscribes to the Event Greening Forum guidelines for low ecological impact events. As such, printing have been limited to participant ID tags. All supporting documentation is available on the meeting mobile app.

This year, we are supporting VK Innovations for the meeting lanyards and bags. They are a social enterprise that works with women and kids in the poorer parts of the country (townships), in an effort to create employment and social empowerment. The organization goes into the most affected homes and put the most affected ones in a special training program that facilitates and teaches the women how to bead, sew and make crafts and the kids to do cultural performances and music so that they can all be self-sufficient and employed. VK Innovations helps them with marketing and sales.

Please also support them in the Exhibition Area where they will be selling African curios.

Onsite Meeting Support

Code of Conduct

The AOAC Sub-Saharan Africa Section acknowledges the freedom of expression of speakers and meeting attendees. It does, however, subscribe to the widely held principles associated with exercising such freedom of expression, i.e. that such expression may not lead to any harm or prejudice to any person or damage to any property, including disruption of the meeting or any activities associated with it. South African law will apply in the event of failure to adhere to these principles.

Emergency Medical assistance and Paramedic Services

For assistance with any medical emergencies, please visit the registration area. Medical procedures and medicine will be for the meeting attendee's own account.

The closest emergency care unit is the Helderberg Hospital, 6 minutes from the hotel, and can be contacted on +27(0)21 850 4700/4/5. For any medical emergencies, please contact +27 (0) 82 925 9241.

General Information Desk

The main information desk is operated by the Lord Charles Hotel staff and is situated in the foyer.

SERVICE HOURS

Registration Times

Tuesday 5 November: 07h30 – 17h00
Wednesday 6 November: 16h00 – 18h00
Thursday 7 November: 07h30 – 17h00
Friday 8 November: 07h30 – 12h00

Liability

Neither the Meeting Secretariat, nor any of its contracted service providers, will be responsible for the safety of articles of any kind brought into the meeting facilities by meeting attendees, whether registered or not, their agents, contractors, visitors and/or any other person/s whatsoever. The Meeting attendee shall indemnify and not hold the organisers and associates of the organisers and their subcontractors liable in respect of any cost, claims, demands and expenses as a result of any damage, loss or injury to any person howsoever caused as a result of any act or default of the Meeting Secretariat or a person representing the Meeting Secretariat, its contractors or guests. In addition, the Meeting attendee shall take all necessary precautions to prevent any loss or damage to his/her property with special regard to mobile phones, carry/handbags and computing equipment.

Meals and Snacks

Food and beverages will be provided to all attendees for the duration of the Workshop & Meeting. All additional meals will be for the meeting attendees own account.

Safety and Security/Lost and Found

In the interest of personal safety and security, attendees should only display their identity tags on the hotel premises and within the restricted meeting areas.

Lost property can be handed in at the registration area. Although every effort will be made to retrieve lost personal belongings, the responsibility for securing his/her personal belongings remains that of each person attending the meeting.

Accommodation and Transport

IMPORTANT: All accommodation and transport arrangements will be for your own account.

Flights

Should you require any assistance with flights, please contact Bruce Rumble at Turners Destination Management, on Bruce@turnersdmc.co.za

Accommodation

Accommodation rates have been negotiated with the hotel. Single standard accommodation @ R1,600 per room (bed & breakfast) and twin standard (sharing room) @ R1,850 per room (bed & breakfast).

Accommodation needs to be booked directly with the hotel. To reserve your room, please contact Cherelle Economon at the Lord Charles on c.economon@nh-hotels.com.
Clearly state that you are booking for the AOAC Meeting to qualify for this rate.

Transfers

The AOAC in partnership with Citi Shuttles, have negotiated discounted airport transfers for attendees. A further 10% discount on below quoted prices will apply if the reference AOAC2019 is quoted upon booking:
1-2 pax = R400
3 pax = R450
4 pax = R600
5-6 pax = R700
7-8 pax = R800

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Fast Facts
South Africa

Population
There are approximately 55 million people in South Africa and 6.2 million people in the Western Cape.

Language
English is the main business and academic language; although there are 11 official languages in South Africa. The main local languages spoken are English, Afrikaans and Xhosa. With large numbers of foreign residents, Cape Town also has significant German, Dutch, French, Chinese and Spanish communities with the available language skills to assist during an international business event.

Climate
Cape Town enjoys a typical Mediterranean climate with a dry, hot summer (max temperature 27° C) and a wet, mild winter (min temperature 7° C).

Water
It is safe to drink the tap water in South Africa although bottled water is readily available as well.

Driving
In South Africa, motorists drive on the left. An international driver's license will be required if a visitor wishes to drive while in South Africa.

Visas
Visas are issued by the South African missions abroad and must be affixed in the applicant's passport before departing for South Africa. Visas are not issued on arrival at South African ports on entry. Many nationalities do not require a visa to enter South Africa, it is best to check with the South African mission or travel agents if this is required.

For further information, please visit:
www.services.gov.za/services/content/Home/ServicesforForeignNationalsTemporaryresidence/Applicationforavisa/en_ZA

Health
There are 2 private emergency units within 5 minutes of CTICC and 9 emergency centres, 2 trauma centres and 4 ambulance services in the City. Cape Town is not a malaria region and there are no tropical diseases to be aware of and no vaccine requirements for visitors although visitors are requested to have the relevant yellow fever injections should they have travelled from or visited an affected area prior to entering South Africa.

Currency
The Rand is the official currency in South Africa and foreign currency can be exchanged at the Cape Town International airport, at commercial banks and at Bureaux de Change. The exchange rate is extremely favourable for visitors:

US$ 15.03
€ 16.78
£ 19.45

Currency exchange as on 31 October 2019

Tax
The majority of goods sold in South Africa are subject to a 15% Value Added Tax (VAT). Visitors are not exempt from paying VAT although they can claim back if the value of the goods bought exceeds R250. To claim the VAT, the goods must be taken out of the country within 90 days from the date of purchase. Visitors who wish to claim VAT should go to the VAT refund administration office or customs official at the port of exit.

For more information, please visit:
http://www.taxrefunds.co.za/

South African Time is GMT +2. There are no time differences within South Africa and no daylight saving. The V & A Waterfront and Canal Walk shopping centres are open until 9pm. Distances are measured in kilometres and metres. Weight is indicated by grams and kilograms. Temperature is mainly measured in degrees Celsius.

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Key Visitor Attractions

These key attractions all lie within close proximity to the city centre.

Cape Point

The Cape of Good Hope and Cape Point form part of the Cape Peninsula National Park. A rocky promontory that juts out into the sea and was once thought to be the southernmost point of Africa, Cape Point is home to 7 750 hectares of indigenous flora and fauna, 150 bird species and the only shellfish-eating baboons in the world. Visitors can also travel by funicular to a viewing point to see where the Benguela and Aghulas currents converge.

Table Mountain

Iconic Table Mountain was afforded National Park status in 1998. The Park offers walks, magnificent views, cable car rides in a modern cable car with revolving floor, hiking, rock climbing – even abseiling and paragliding.

Kirstenbosch Botanical Gardens

Established in 1913, on the south eastern slopes of Table Mountain, the Gardens cover 528 hectares and are the best place to view the Cape Floral Kingdom; known locally as fynbos, it offers more floral diversity than the whole of Europe combined.

Constantia Wine Valley

The Western Cape is a historic wine producing region and it all started in Constantia in 1695. Featured in novels by Jane Austen and preferred by Napoleon, the wines of Constantia are legendary.

V&A Waterfront

This unique working harbor with scenic views of Table Mountain combines high-end shopping with entertainment, fine dining, boat trips and a world-class aquarium. Some of the City's finest hotels are situated here.

Robben Island

For those who followed the political history of South Africa and feel an affinity with Nobel Laureate, Nelson Mandela, a visit to Robben Island is a must. One of South Africa's 4 World Heritage Sites, Robben Island is a moving tribute to the late President Mandela's dreams of freedom.

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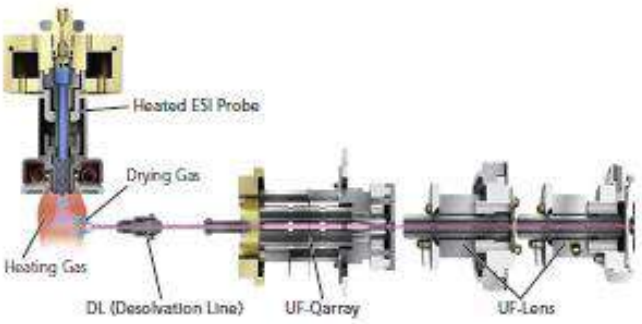

Fusion of sensitivity and speed

Programme Schedule
Pre-meeting Workshop

Tuesday 5 November
Analytical Method Validation/Verification

Time	Title	Speaker
07h30	Registration opens - arrival coffee and tea	
08h00	Chemical methods validation – Nutritious and Toxic elements in food	Maré Linsky, NMISA
08h45	Approaches for Method Validation for Chemical Contaminants - pesticides, vet drugs and mycotoxins	Narendra Meruva, Waters Inc.
09h30	Chemical methods validation – Rapid methods for mycotoxins	Patricia Jackson, Vicam
10h15	Mid-morning refreshments	
10h45	Introduction to microbiology method validation	DeAnn Benesh
11h15	Microbiology method validation – Reference methods	Erin Crowley, Q Laboratories, Inc.
12h15	Lunch	
13h15	Validation of alternative microbiology methods	Erin Crowley, Q Laboratories, Inc.
13h45	Extending the scope of an existing microbiological methods	DeAnn Benesh, Independent Consultant
14h15	AOAC protocol for new method chemical development	Joe Boison, Independent Consultant
15h00	Extending the scope of an existing chemical methods	
15h45	Mid-afternoon refreshments	
16h00	Mastering the basics – from sampling to analytical results qualification	Philip Randall, P Cubed
16:45	Close of Workshop Day 1	
	Free Evening	

Wednesday, 6 November 2019
Analytical Method Alignment/ Harmonisation

Time	Title	Speaker(s)
07h30	Registration opens - arrival coffee and tea / Industry Networking	
08h00	What makes a method fit for purpose – Panel discussion	Moderator: Jayne de Vos, NMISA ▪ DeAnn Benesh, Independent Consultant ▪ Erik Konings, Nestlé Research ▪ Joe Boison, Independent Consultant ▪ Laura Quinn, NMISA ▪ Geoffrey Muriira, Kenya Bureau of Standards ▪ Narendra Meruva, Waters Inc. ▪ Erin Crowley, Q Laboratories, Inc.
09h00	Analytical Methods Alignment – Launch of the AOAC SSA Digital Analytical Methods Sharing platform & Presentation of Sodium Whitepaper	Owen Fraser, Nestlé Research
10h30	Mid-morning refreshments/Industry networking	
11h00	ISO 17025 Accreditation – what you need to know	Shadrach Phophi, SANAS
11h30	Preparing for ISO 17025 Accreditation – Preparation and common non-conformity	
12h00	Certified Reference Materials & Quality Control Standards – What you need to know	Kurt Johnson, Trilogy Laboratories

Time	Title	Speaker(s)
12h30	Lunch	
13h30	Laboratory safety – Chemistry Best Practices	Speaker to be confirmed
14h00	Laboratory safety – Microbiology Best Practices	Erin Crowley, Q Laboratories, Inc.
14h30	Inside laboratory control & management – Lean, Green laboratory concept	Hansjurg Ludi, HLUDI
15h00	Mid-afternoon refreshments/Industry networking	
15h30	New Method Development	Mark Pieterse, Shimadzu
16h00	Laboratory ICP and common essential instrument maintenance	Frans Masha, Shimadzu
16h30	Open Discussion / Q&A Session	
17h00	Closing remarks	
17h00	**Business on Top| Party on the Bottom Reception at the Pool Deck**	

Programme Schedule Meeting

Thursday 7 November

07h30	Registration opens - arrival coffee and tea / Industry Networking		
	Session Chair: Musa Shongwe		
08h30	Opening session	President's Welcome, thank to members, partners and collaborators and year in review	Owen Fraser, Nestlé Research
09h00	Harmonisation of testing standards – critical to the trade of safe foods in Africa	AOAC INTERNATIONAL – Improving the quality of testing & developing analytical methods for regulatory compliance	Erin Crowley, Q Laboratories, Inc. & President-Elect AOAC INTERNATIONAL
09h30		Trading of safe foods in Africa (the African food safety landscape and the creation of the African Food Safety Agency and the benefits of harmonising of testing standards)	Winta Sintayehu, African Union Commission – Department of Rural Economy and Agriculture
10h00		Testing and regulatory compliance – a global view	Paul Young, Waters Inc.
10h30	Mid-morning refreshments/Industry networking		
	Session Chair: Owen Fraser		
11h00	Harmonisation of testing standards – critical to the trade of safe foods in Africa	Analytical methods capability and regulatory compliance	Erik Konings, Nestlé Research
11h30		The state of testing infrastructure in Africa and how the AOAC SSA Section can contribute to its development – Panel Discussion	Moderator: Ephraim Moruke, DAFF ▪ Erin Crowley, Q Laboratories, Inc. ▪ Paul Young, Waters Inc. ▪ Corey Luthringer, Lodestar Centre of Excellence ▪ Winta Sintayehu, AUC ▪ John Bee, Nestlé ▪ Dharmarai Naicker, CSIR
12h30	Lunch		

Time	Title		Speaker
		Session Chair: Liberty Sibanda	
13h30	Challenges in testing – a focus on traditional African foods	Microbiological safety of foods and the application of whole genome sequencing	Pieter Gouws, University of Stellenbosch
14h00		Emerging challenges – Cannabis testing and regulatory issues	Narendra Meruva, Waters Inc.
14h30		Pesticides and residue testing in foods	Laura Quinn, NMISA
14h50		Toxic element in foods	Elrisa Taljaardt, Labworld
15h10		Mycotoxin occurrence in traditional African foods	Limbikani Matumba
15h30	Mid-afternoon refreshments/Industry networking		
		Session Chair: Joe Boison	
15h50	Challenges in testing – a focus on traditional African foods	Naturally occurring toxins in traditional African ingredients	Nomusa Dlamini, CSIR
16h20		The occurrence of mycotoxins and veterinary drugs in meat and meat products in Africa	Mulunda Mwanza, North West University
16h50		Afternoon session discussion and Q&A	
17h30		Close of Meeting Day 1	
19h00	Gala Dinner – Studio 54 Disco Fever (come dressed for the part!)		

Friday 8 November

07h30	Registration opens - arrival coffee and tea / Industry Networking		
Time	Theme	Title	Speaker
		Session Chair: Vallerie Muckoya	
08h30	Perkin Elmer Young Scientist Session	Supporting young scientist development: A personal journey	Vallerie Muckoya, University of Johannesburg
08h45		Quantitative risk Assessment of mycotoxins in maize meal and stiff porridge (Cooked maize meal) in Limpopo Province of South Africa	Shandry Tebele, University of Johannesburg
09h00		Polybrominated diphenyl ethers (PBDEs) in a selected canal in Port Elizabeth, South Africa	Chinemerem Ohoro, University of Fort Hare
09h15		Evaluation of silver nanocomposite polymer inclusion membranes (PIMs) for trace metal extraction in natural waters	Kgomotso Maiphetlho, University of the Witwatersrand
09h30		Classification and Adulteration Detection of Honey from Different Floral and Geographical Origins – Case of Zambian and Botswana Honey	Tumelo Padiso, University of Botswana
09h45		Mycotoxins in animal milk consumed in Nigeria determined by a sensitive LC-MS/MS method	Oluwatosin Akinyemi, North West University
10h00		Discussion and Q&A	

Posters will be presented orally in parallel sessions in the Exhibition Area from 10h15 – 11h00. Presenters will communicate with delegates through a microphone and headset for a short presentation. Presentations can be repeated if you would like to attend both in the same time slot. Please advise the secretariat of your request.

Time		Poster Pod 1	Poster Pod 2
10h15	Oral Poster Presentations	Relative quantification of TAB spoilers in AFB ingredients - *Eric Samuels*	Strategy study for the prevention of contamination of fresh pineapple juices produced in artisanal sector : cases of 4 sites of district of Abidjan- Ivory Coast - *Yolande Ake Assi*
10h25		Evaluation of alternative DNA extraction protocols for discriminating legionella viable cells - *Eric Samuels*	Building Analytical Capacity for Fortification Quality Assessment in Nigeria - *Olapeju Phorbee*
10h35		EN ISO 16140-2 Validation study of the GeneDisc® methods for STEC detection in food samples - *Eric Samuels*	Bioanalysis of the Geneva phenotyping cocktail in whole blood collected with volumetric absorptive micro sampling by LC-MS/MS, - *Machel Leucshner*
10h45		Evaluation of the GeneDisc® STEC top 5 short protocol for same day release of raw beef meat samples - *Eric Samuels*	
11h00	Mid-morning refreshments		
Time	Title		Speaker
Session Chair: Jayne de Vos			
11h20	Advanced Analytical Technologies – Engaging our Partners	European Water Framework	Pieter Stoutjesdijk, Gerstel
11h30		NIR as a standard method in the food industry	Eileen Fouche, Labotec
11h40		Taking the Laboratory to the Sample with iCheck	Anna Shenchuk, BioAnalyt
11h50		Mycotoxins analysis/kits, équipements and services proposed by the rBiopharm Group	James Szimeth & Marcel Bony, r-Biopharm
12h00		Topic tbc	Separations
12h10		Microbiology Testing to Standard - Equipment and Essential Maintenance	Cameron Hutchinson, Lasec
12h20		Topic tbc	Hein Venter, Anatec
12h30		Discussion and Q&A	
12h45		Young Scientist Award 2019	
12h50		President closing remarks	Owen Fraser, Nestlé Research
13h00	Lunch & Departure		

Young Scientist Abstracts

Quantitative risk Assessment of mycotoxins in maize meal and stiff porridge (Cooked maize meal) in Limpopo Province of South Africa

Shandry Tebele
University of Johannesburg (Masters student), tebeleshandry@gmail.com

Maize is one of the most essential staple foods worldwide and susceptible to a wide variety of mycotoxins. A total of 22 mycotoxins were quantified in maize meal (24) and stiff porridge (20) samples from Limpopo Province in South Africa using liquid chromatography-tandem mass spectrometry (LC-MS/MS). Twelve out of 22 mycotoxins were detected in samples, including α-zearalenol (α-ZEL) (86%), fumonisin B_1 (FB_1) (91%), fumonisin B_3 (FB_3) (91%), tenuazonic acid (TeA) (73%), ochratoxin B (OTB) (39%), deoxynivalenol (DON) (14%), ochratoxin A (OTA) (7%), 3-Acetyldeoxinivalenol (3-ACDON) (7%), sterigmatocystin (STG) (7%), aflatoxin B_2 (AFB_2) (2%) and 15-Acetyldeoxinivalenol (15-ACDON) (2%). Fumonisins (FB_1 and FB_3) exceeded the maximum level of European Commission Regulations. It is imperative to monitor the level of mycotoxins in food commodities as high concentration (2153 ppb) of FB_1 was detected in maize meal. Furthermore, the study assessed the health risks of exposure of adults and children to the main mycotoxins in maize meal and porridge. The estimated probable daily intake (PDI) values and at 95th percentile PDI values of α-ZEL and DON through maize meal intake were above provisional maximum tolerable daily intake (PMTDI) (2 µg/kg body weight/ day) for children, while PDI values of fumonisins (FBs) were high for both children and adults and OTA was below for both age groups. In addition, PDI values of FBs, DON and OTA through consumption of porridge at 95th percentile was lower than PMTDI for both age groups with an exception of α-ZEL which was above for children. Although FBs were highly detected in the maize meal samples and co-occurrence of mycotoxins was observed in maize meal and porridge. The occurrence of multi-mycotoxins inclusive of emerging mycotoxins with no regulation may result in health implications on humans. However, there were no significant health risks were observed through dietary exposure assessment.
Keywords: mycotoxins, maize, LC-MS/MS, risk assessment, South Africa

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Polybrominated diphenyl ethers (PBDEs) in a selected canal in Port Elizabeth, South Africa

Chinemerem Ruth Ohoro
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Polybrominated diphenyl ethers (PBDEs) have become issues of global concern owing to their implication in neurologic, immunological and reproductive disruptions. Some congeners of PBDEs have also been listed as persistent organic pollutants (POPs) at the fourth conference of Stockholm Convention. In this study, seven congeners of PBDEs (BDE- 17, 47, 66, 100, 153, 183, 209) were determined in a major tributary of Swartkops River in Port Elizabeth City. Solid-phase extraction and ultrasonic extraction techniques were utilized for the extraction of these pollutants in the water and sediment samples respectively. Sediments were further subjected to silica gel column clean up after extraction. PBDEs in all the samples were subsequently quantified using gas chromatography-electron capture detection. The results showed that BDE 100 was not detected in most of the sampling points, but appeared to be high at few points where it was detected at concentrations between 0.88 µg/L – 15.458 µg/L in water; and 0.11 µg/kg – 6.275 µg/kg in sediment. However, BDEs 47, 66, 153 were detected in all the points at concentration ranging from 0.01 µg/L to 0.63 µg/L, 0.003 µg/L to 13.235 µg/L, 0.001 µg/L to 1.287 µg/L in water but varying as 0.2 µg/kg to 1.62 µg/kg, 0.2 µg/kg to 1.052 µg/kg, 0.01 µg/kg to 7.293 µg/kg in sediment. Serum sex hormone is notable among the body parts that are greatly affected by exposures to PBDEs. There is therefore need for constant monitoring and caution about waste discharges, especially from industries in the area. This is to help guarantee the safety of all that live in the neighbourhood and those using the canal water for their domestic requirements.

Keywords: Polybrominated diphenyl ethers; Endocrine disruptors; Ultrasonic- assisted Extraction; Solid-Phase Extraction

Evaluation of silver nanocomposite polymer inclusion membranes (PIMs) for trace metal extraction in natural waters

Kgomotso Maiphetlho
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The shortcomings of the conventional membranes in water applications such as low stability and the hydrophobic nature reduces the membrane productivity and lifespan. These result in expensive procedures that hinder membrane science technology. Hence, recent investigations have resulted in the synthesis of nanocomposite membranes as an alternative. In this work, silver nanocomposite polymer inclusion membranes (PIMs) were synthesized to evaluate the extraction of trace metal ions in natural waters. The evaluation of the synthesized PIMs demonstrated that the PIMs containing silver nanoparticles (AgNPs) exhibit better extraction capacity as opposed to the bare PIMs and the PIM with (40 w.t% D2EHPA, 10 w.t% AgNPs and 50 w.t% PVC) had the optimum composition. It was then used to optimise the parameters that are important for the extraction of trace metal ions. The selectivity of the nanocomposite PIM was investigated and it was found that its affinity towards a range of divalent cations in synthetic water solutions, based on the percentage recovery factor of the extracted metal ions, follow the order: Cd(II) > Cu(II)> Ni(II)> Co(II.) This order can be explained by the *Hard* and *Soft Acids* and *Bases Theory* and the hydration energy of the metal cations. However, the stability of the PIM was still compromised during repeated cycle operations despite an improvement of hydrophilicity with introduction of AgNPs, this was indicated by an appreciable leaching of the carrier (D2EHPA) and AgNPs in a 4:1 ratio. This silver nanocomposite PIM was tested in dam water. No matrix effect was observed on metal ion transport efficiency in such waters. The designed PIM system has the potential to be used as passive sampler for in situ extraction of the target metals in water systems. However, further studies are needed to improve the stability of both the carrier and nanoparticles in the membrane.
Keywords: Polymer inclusion membranes (PIMs), di-(2-ethylhexyl) phosphoric acid (D2EHPA), trace metals, membrane extraction, silver nanoparticles (AgNPs), membrane fouling

Classification and Adulteration Detection of Honey from Different Floral and Geographical Origins – Case of Zambian and Botswana Honey

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Some of the physicochemical properties for three commercial and three real natural honeys from Zambia and Botswana were determined as specified by the International Honey Commission. Some of the parameters were specific conductivity, water and ash contents, pH, and acidity. One commercial honey from Zambia i.e. ZAM 1 had a moisture content of 18.56 % and electrical conductivity of 0.725 mS/cm. Further, the honeys were also analyzed for adulteration with sucrose, fructose, maltose and glucose. Partial validation of the FTIR method used for adulteration detection gave limits of quantification (LOQ) values that ranged between 1.80 and 5.12 % w/v, with calibration curves that were linear indicated by R^2 values that ranged between 0.9858-0.9989. The concentration ranges for the sugars were as follows (% in brackets): sucrose (LOQ-6.01), fructose (34.69-43.66), maltose (5.38-12.88) and glucose (25.52-32.57). The A metabolomic classification of the same honeys based on geographic and floral origins was also done forthwith. Classification using gas chromatography – mass spectrometry/solid phase micro extraction (GC-MS/SPME) was accomplished on three commercial and three unprocessed organic honeys (p<0.05). The Automated Mass spectral Deconvolution and Identification System (AMDIS), *Metab* R, an R platform application and MINITAB version 14 were used for data processing. 17 volatile

metabolites in three commercial and 42 in three unprocessed organic honeys were identified, confirmed and formed the basis for differentiation. Database search showed that, the honeys were polyfloral with major ingredients coming from common flowering plants, conifers and other gymnosperms such as *Carica papaya L.* (papaya), *Monstera deliciosa* (Ceriman) and fruits i.e. guava, melon and pineapple endemic in the areas from which the honeys originated from.

Keywords: Electron Ionization, SPME, *Metab* R, AMDIS, Perfluorotributylamine, Metabolomic

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Mycotoxins in animal milk consumed in Nigeria determined by a sensitive LC-MS/MS method

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Animal milk is often sourced from mammals such as buffalos, camels, cows and goats. The milk serves as an important food source in many households, especially among those of low-income status, due to its high nutritive value. A major concern to the quality of milk that are produced from locally bred animals is contamination by toxic secondary metabolites of fungi known as mycotoxins. These poisonous substances are carried over into animal products (e.g. egg and milk) from contaminated animal feed; hence, could pose a serious threat to human health. Majority of the studies on mycotoxins in animal milk have focused on detecting aflatoxins (B1 and M1). Thus, the occurrence of other mycotoxins in animal milk has received very limited attention. Here, we present the application of a highly sensitive and quantitative LC-MS/MS method in assessing 36 mycotoxins including the regulated aflatoxin M1 in milk as well as potentially emerging mycotoxins and key metabolites. The method was applied to examine 73 milk samples obtained from camels, cows and goats in Nigeria. A total of 12 mycotoxins were detected in the milk samples at varying levels in the ng/L ranges. At least one mycotoxin was found in 97% of all the samples. Goat milk, cow milk and camel milk contained 10, 8 and 4 mycotoxins, respectively. Beauvericin was the most frequently detected mycotoxin in milk samples from the three animals in addition to aflatoxin M1 and enniatin B that were also most frequently found in cow milk. Aflatoxins were not found in camel milk. This study has shown that animal milk may be an additional source of multi-mycotoxin exposures in the low-income setting where animal milk is consumed on a daily basis. Consequently, mitigation efforts for mycotoxin reduction in the food chain should also target the dairy chain.

Keywords: Camel, cow, goat, environmental contaminants, food safety, milk, public health.

Oral Poster Abstracts

Relative Quantification of TAB Spoilers in AFB Ingredients

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Introduction - *Alicyclobacillus* (TAB) are acidophilic, thermophilic, gram-positive bacteria that cause spoilage of fruit juices due to endospore survival of pasteurization. Ingredient risk assessment is part of an overall strategy to prevent TAB spoilage. However, traditional culture-based methods (IFU 12) may take over a week, causing product holds or supply chain disruptions. In order to reduce time to result to as short as 3 h, a new qPCR-based method was developed using the GeneDisc® PCR based technology from Pall Corporation for relative quantification of TAB contamination in filterable samples.

Material and Methods - 105 sugar samples including superfine sugar, cane sugar and glucose syrup, were spiked with the four major TAB spoilage bacteria (*A. acidoterrestris*, *A. acidophilus*, *A. cycloheptanicus*, *A. herbarius*). The sample sizes were between 10 and 200 g. Artificially contaminated samples were diluted with distilled water and filtered through polycarbonate 0.4 µm membrane. After cell lysis on the filter, qPCR analyses were

performed using the GeneDisc Plate TAB Spoilage on DNA extract which could be further concentrated with the Nanosep® centrifugal device 30K. This method was also tested on naturally contaminated maltodextrine samples collected before and after micro-filtration from a sugar industry.

Results - Whatever the sample size and the spiking dose, Ct values obtained with the DNA and cells ranges from pure culture and spiked sugar samples were very close; this demonstrated that the semi quantitative method was reproducible and linear between 100 and 10,000 bacteria/sample. Applied to naturally contaminated maltodextrine samples, this method enabled monitoring of the micro-filtration efficiency; a 4 Log reduction in *Alicyclobacillus* spp. was shown between the incoming fluid and the filtrate where none of the four TAB major spoilers were detected.

Discussion - With this GeneDisc method, fruit juice and ingredient producers can now increase their profitability by implementing early and rapid in-process controls as well as checking efficacy of their TAB contamination reduction countermeasures.

Strategy study for the prevention of contamination of fresh pineapple juices produced in artisanal sector: cases of 4 sites of district of Abidjan- Ivory Coast

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The present study aims to help identify the strategies for improving the physicochemical characteristics and the sanitary quality of artisanal pineapple juices sold along the roads in the communes of the District of Abidjan. A total of 38 artisanal pineapple juice samples were collected in the communes of Cocody, Treichville, Marcory and Koumassi and analyzed. The microbiological and physicochemical characteristics were evaluated by measuring the microbial loads expressed in CFU / g of fruit juice and by the determination of mycotoxins (patulin), metallic trace elements and pesticides. According to laboratory results, microbiological analysis revealed that the juices are free of pathogenic germs (Salmonella). Fecal coliforms and Lactobacillus spare the most implicated in the causes of pineapple juice releases. Sampling identified yeasts, molds, and anaerobic sulphite-reducing flora in the samples. At the level of chemical contaminants, the analyzes show the presence of metals but also pesticides. These results suggest a disrespect of hygiene rules training campaigns and information on the hygiene of food handlers in the district of Abidjan are important to ensure greater consumer safety.
Keywords: pineapple juice, artisanal processing, juice hygiene quality, patulin, artisanal processing.

Evaluation of Alternative DNA Extraction Protocols For Discriminating *Legionella* Viable Cells

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Introduction - Water quality is a real concern for food industries and can put at risk food production plants. Compared to traditional culture method (ISO 11731), Real Time-PCR based methods enable to significantly shorten the time-to-results for *Legionella* detection in water samples from 3-10 days to few hours. However, drawback of molecular methods remains its discrepancy with traditional culture-based methods due to detection of free DNA, Viable but not culturable cells, and dead cells.

Purpose - The GeneDisc® *Legionella* method in clean water samples and two alternative DNA extraction protocols, including a smaller test portion (A) or an addition centrifugation step (B), were compared to the culture method (ISO TS 13171).

Methods - Six different clean water samples were analyzed. After homogenization, sample sizes of 200 mL were analyzed by the culture method and the three GeneDisc protocols.

Results - The results showed that the reference method gave presence of *Legionella* in 3 out of 6 samples. The alternative protocol A, based on a reduced test portion, enabled to get comparable results to the reference method in terms of presence/absence, while the current GeneDisc method for *Legionella* detection in clean water sample and the alternative protocol B concluded presence in all six samples.

Significance - This new protocol A allows to significantly reduce the number of false positive due to detection of dead cells and/ or free DNA and to get results comparable to the culture method in as short as 2 hours. This new GeneDisc *Legionella* method enables to real-time monitor *Legionella* in clean water samples.

Building Analytical Capacity for Fortification Quality Assessment in Nigeria

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Objective - Inadequacies in the capacity of laboratories to quantify micronutrient content in food items remain one of the main constraints to monitoring and ensuring food fortification quality in Nigeria. To mitigate against this challenge, we implemented an innovative institutional mentorship process designed to strengthen local laboratory performance on micronutrient analysis in foods. Here, we report on this process and outcomes.

Methods - We implemented a sequential process comprising (1) a needs assessment, (2) customized mentorship program, and (3) proficiency testing with purposively selected laboratories in Nigeria. Based on their quality management system and accreditation status, five public and private sector laboratories were selected in consultation with the government of Nigeria. Sampling, testing, and recording, facility, and capacity requirements that were impediments to accreditation were identified. A systematic and customized process of capacity and capability strengthening on micronutrient testing and ISO/IEC 17025:2017 accreditation readiness was implemented over two months and structured around accreditation by the Nigeria National Accreditation Service (NiNAS) for Vitamin A, Iron, Zinc, and Iodine analysis in foods. To assess the performance of the laboratories, a Proficiency Test (PT) was conducted, using homogenized food samples. The samples were analysed by all participating labs as well as a reference laboratory for validation.

Results - Four of the five labs have attained readiness for accreditation by the NiNAS for micronutrient Conformity Assessment for Vitamin A, Iron, Zinc, and Iodine in foods.

Conclusions - The use of AOAC official methods for the quantification of analytes of interest in food is a critical factor for fortification program assessment. Local laboratory performance can be enhanced through customized mentoring, and testing capacities can be routinely assessed with local PT samples and further improved upon. We expect to replicate this approach and build on lessons learned to strengthen laboratory performance in Nigeria and elsewhere.

Keywords: Micronutrients, Fortification, ISO/IEC 17025:2017, AOAC, Mentoring, Proficiency Testing (PT), Accreditation

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EN ISO 16140-2 Validation study of the GeneDisc methods for STEC detection in food samples

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Introduction - Detection of pathogenic Shiga toxin-producing *E. coli* (pSTEC) typically rely on two successive PCR screening steps as described in the ISO/TS 13136 reference methods. Combination of the GeneDisc plates STEC and EHEC ID is fully compliant with the ISO/TS 13136 while the GeneDisc Plate STEC Top7 is a one-step

multiplex PCR based method enabling to reduce both the rate of presumptive PCR positive results and the time to result. An independent study was conducted to compare these GeneDisc methods to the ISO/TS 13136 (reference method) according to the ISO 16140-2 (2016) standard for NF validation approval.

Materials and Methods - Vegetables including sprouts, raw dairy products and raw beef samples (25 g) were 1:10 diluted in buffered peptone water (BPW) and incubated at 37°C for 8 to 20 h. Dairy Samples were supplemented with acriflavine (10 mg/l) prior to incubation. After lysis by heating for 10 min at 100°C on 50 µl of enriched sample, real-time PCR was performed. In case of presumptive positive result with the GeneDisc STEC Top7, immunoconcentrate resulting from immuno-separation (IMS) for the targeted serogroup was analyzed with the GeneDisc STEC Top7, prior isolation on chromogenic agar plate. The study compared the sensitivity, relative limit of detection (RLOD), inclusivity, exclusivity ad practicability. An inter-laboratory study enables to determine variability of the results obtained in different laboratories.

Discussion - Overall, 231 samples were analyzed by the reference method and both alternative methods. Good performance was observed, as the sensitivity of the alternative method (84.3%) was higher than that of the reference method (66.7%). The relative trueness was calculated at 77.1% and the false positive ratio of the alternative method was 4.9%. The RLODs calculated for raw beef meat, raw milk, raw milk cheese, baby leaves and sprouts were comprised between 0.31 and 1.25, suggesting that both methods have the comparable limit of detection. The 50 tested target strains were detected, and no cross-reaction was observed with the 30 tested non-target strains. The inter-laboratory study results comply with the EN ISO 16140-2:2016 requirements. The alternative method is reliable and reproducible for the detection of pSTEC, and the negative results were available two days earlier than the reference method. The alternative method is considered equivalent to the ISO standard.

References

ISO/TS 13136
ISO 16140-2

Evaluation of The GeneDisc® STEC Top5 Short Protocol for Same Day Release of Raw Beef Meat Samples

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Introduction - For release of raw ground beef products, manufacturers have to guarantee absence of Shiga toxin-producing E. coli (STEC) in 25 g of sample. In order to limit cost linked to storage, the time to result (TTR) of the method for STEC detection should be less than one workday shot, i.e. 8 hours.

Purpose - As part of the ISO 16140-2 (2016) validation of GeneDisc® STEC Top5 method, an independent sensitivity study compared a short protocol for raw beef samples (5 h) to the ISO/TS 13136:2012 reference method.

Methods - 39 raw beef samples were included in the study. Three enrichment times were tested for the alternative method: 5 h, 8 h and 20 h in Buffered Peptone Water at 41.5°C. The test portion for DNA extraction was 5 mL after 5 h of enrichment and bacteria were concentrated by centrifugation. For a longer incubation time (8-20 h), 50 µL of enriched sample were directly transferred into a lysis tube. After mechanical lysis, the resulting DNA extract was analyzed thanks to the STEC Top7 GeneDisc Plate.

Results - The results showed 6 negative deviations and 10 (5 h enrichment) or 11 (8-20 h enrichment) positive deviations. The only difference observed after 5 h of enrichment; compared with longer incubation (8 h and 20 h), corresponded to a seasoned beef sample which was done negative by the GeneDisc method after 5 h incubation (negative agreement with the reference method) and became positive after 8-20 h incubation (positive deviation).

Significance - This study demonstrated that the GeneDisc method for early detection of STEC in raw beef meat samples fulfils the EN ISO 16140-2:2016 requirements. Applied to the beef industry, this method enables manufacturer to significantly decrease the storage time of fresh products before release.

Bioanalysis of the Geneva phenotyping cocktail in whole blood collected with volumetric absorptive microsampling by LC-MS/MS

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Background - Poor therapeutic response to medication has been attributed to inter-individual and interethnic variability in cytochrome P450 (CYP450)-dependent metabolism and altered drug retention associated with P-glycoprotein (P-gp). An individualised pharmacotherapeutic approach would benefit South-Africans considering the country's large genetic diversity. A low dose probe drug cocktail followed by a single time point, minimally-invasive capillary sampling, to simultaneously quantify *in vivo* drug and metabolite concentrations, could enhance the feasibility and cost-effectiveness of routine phenotyping towards personalised medicine. This study aim was to develop a validated, targeted, analytical method to quantify the seven probe drugs and their metabolites in dried blood spots (DBS) when using the Mitra™ volumetric absorptive micro-sampling device for blood collection.

Methods - Agilent binary liquid chromatography (LC) system coupled to a Sciex 4000 QTRAP triple quadrupole tandem mass spectrometer (MS) was used for method optimisation and validation. Optimised source conditions and fragmentation parameters were used to monitor the most abundant MRM transitions for all analytes. Targeted LC-MS/MS methods, in negative and positive ESI mode, were validated according to ICH guidelines. Agreement between the *in vitro* quantitative measurements in DBS and conventional plasma sampling was assessed.

Results - The validated LC-MS/MS method met the required bioanalytical standards for specificity, sensitivity, linearity, accuracy, precision, carry-over and stability. *In vitro* assessment of agreement between DBS and plasma sampling showed deviations > 20 % (measured against predicted plasma concentration). These findings were related to the blood-to-plasma concentration ratio, the physicochemical properties and stability of the analytes as well as the extraction efficiency from the Mitra™ sampler.

Conclusion - This study successfully validated the use of DBS, collected with the Mitra™ microsampling device, to measure expected probe drug and metabolite concentrations using the "Geneva phenotyping cocktail" for the purpose of simultaneous phenotyping of the *in vivo* CYP450 metabolic activity of the CYP1A2, -2B6, -2C9, -2C19, -2D6 and -3A4 enzymes and P-gp transport activity, although agreement between the two matrixes were not straightforward.

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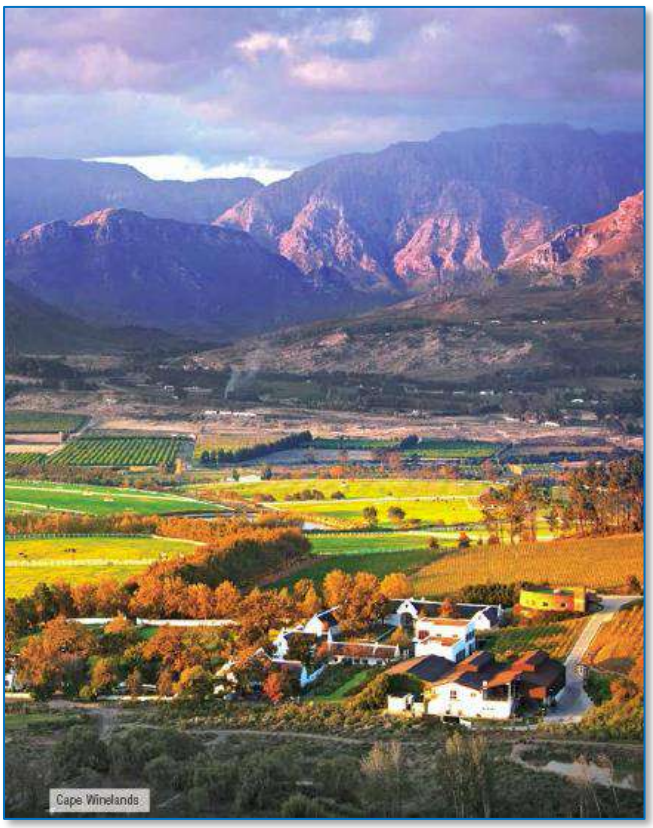

Cape Town is unusually rich in diversity and offers a host of activities for visitors. Apart from sightseeing, shopping markets and high-end brands and visiting iconic World Heritage sites and beaches, the Western Cape also offers a wealth of cultural heritage, like food and wine, and is a favourite destination for adventurous activities such as rock-climbing and cycling. The largest timed cycle tour in the world takes place here every year and there is a cycle tour between Cape Town and Knysna, on the Garden Route, for the truly adventurous.

Cape Point

Cape Point is the southernmost tip of the Cape Peninsula. The drive takes you via Chapmans Peak past steep mountains, secluded coves, beaches, villages and fishing communities.

At Cape Point visit the Cape of Good Hope nature reserve – home of fynbos species found nowhere else in the world and a variety of wildlife including baboons, rhebok, Cape Mountain zebra, bontebok and the elusive eland. Return via the historical Simonstown naval base.

Panoramic Cape Town City Tour

Visit the Castle, the oldest building in South Africa, then move on to another historic area of the city, the Cape Malay quarter situated on the slopes of Signal Hill. Imbibe its rich spiritual, musical and culinary heritage before diving down into the city centre itself. Drive along Adderley Street, the lively centre of town, past the historic Groote Kerk and St. George's Cathedral, the Anglican Diocese of Nobel peace laureate Archbishop Desmond Tutu.

Table Mountain

A cable car ride to the top of Table Mountain, a World Heritage Site, is a highlight of any Cape Town visit. The cableway takes you to the summit in under ten minutes whilst rotating gondolas ensure a 360-degree view of Cape Town and Table Bay. At the top stroll along 2km of pathways and enjoy magnificent views from over 12 viewing sites and decks. Facilities on the mountain include a self-service restaurant, bistro, and a shop selling gifts and curios.

Winelands Tour

A visit to the Cape Winelands is an absolute must as the region is one of breath-taking vistas and majestic mountain backdrops while being steeped in rich culture and history. Rolling vineyards and quaint Cape Dutch homesteads await you, as well as award-wining wine farms offering some of the country's best wines. The most popular and well-known regions are Stellenbosch, Franschhoek, Wellington, Paarl, and the Constantia Valley, that is just a 10-minute drive from the city centre.

Robben Island

Famous Robben Island, whose prison was once home to former South African president Nelson Mandela as well as many other black political freedom fighters, is now a World Heritage Site and provides stunning views across the bay with Table Mountain as its backdrop. A trip to the island is an unforgettable experience and offers a glimpse into the life and times of the apartheid era. Daily tours to the island, that take approximately 31/2 hours, include the ferry trip there and back, an island tour and a tour of the prison with a former political prisoner as your guide.

Kirstenbosch Botanical Gardens

The beautiful Kirstenbosch gardens cover an area of 528 hectares with 36 hectares of

cultivated garden. The gardens are a celebration of South African flora – showcasing only indigenous South African plants. Fynbos, proteas, cycads and rolling lawns are intermingled with streams and ponds and well-laid out pathways for easy walking.

Cultural Tours

A visit to one of the many townships surrounding the city is an experience that will open your eyes to the way in which the biggest portion of Cape Town's population lives. Take a township tour of Langa, the oldest township in South Africa or vibrant Khayelitsha, the second largest township in South Africa.

Township tours will usually be co-led by a resident in the area, showcase local industry and community projects and include a visit to a township bar or 'shebeen'.

Adventure Activities

Cape Town, and the Western Cape, caters for the more adventurous at heart.

The mountains surrounding the area provide the perfect foil for abseiling, hiking, paragliding and mountain biking while the oceans are a playground for surfing, deep sea fishing and shark cage diving.

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