



INTERNATIONAL SYMPOSIUM ON FOOD SAFETY

Organised by

DURBAN UNIVERSITY OF TECHNOLOGY,
Department of Biotechnology and Food Technology

In collaboration with

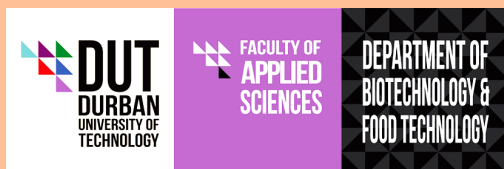
SELAMAT

(Safety Enhancement of Edible Products, Legislation, Analysis and Management, with AAA Countries, by Mutual Training and Research)

Date: 17 May 2017

Time: 08H00—17H00

Venue: Coastlands Musgrave, KZN, South Africa



SELAMAT COORDINATORS



Dr Hans Marvin

Wageningen University and Research
RIKIILT Institute of Food Safety, Wageningen,
The Netherlands



Dr Oluwatosin Ijabadeniyi

Senior Lecturer and Food Science Research
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Mr Piet Stouten

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ORGANISING COMMITTEE

Mr Piet Stouten

Dr Oluwatosin Ijabadeniyi

Prof Kugen Permaul

Ms Sohana Ranglal

SYMPOSIUM WEBSITE

<http://www.dut.ac.za/one-day-international-symposium-on-food-safety-why-you-should-attend>



ABOUT SELAMAT

SELAMAT is a sustainable global network for international co-operation on food safety involving organizations (research organizations, academia and authorities) from all over the world. SELAMAT is coordinated by RIKILT Wageningen University and Research, the Netherlands and IBET, Portugal. SELAMAT organized highly appreciated training courses, workshops and conferences, initiate joint research projects and facilitates exchange of personnel. Original the network started in 2004 as an EU funded project focusing on collaboration between EU- Asia. However, since 2012, it has extended its initiatives and now also partners from Brazil, Russia and Africa are involved. A further extension is foreseen. Currently, SELAMAT has partners in the Netherlands, Portugal, Malaysia, China, Thailand, South Korea, Russia, Brazil, Ghana, South-Africa, Nigeria, Mauritius, United Kingdom and Iran.

Partners of SELAMAT highly recognize the following benefits of their membership:

1. The SELAMAT network is built on confidentiality and trust
2. Means to extend their own network on food safety and related topics. SELAMAT members may be helpful to identify organizations in other parts of the world.

3. Platform to share knowledge on food safety and related topics (food quality, food security etc) and to discuss “sensitive” information
4. Platform to discuss future developments and food safety issues
5. Opportunity to influence food safety research agenda in the various parts of the world
6. Means to initiate joint research projects (examples are the successful grants in EU framework programme: GO-GLOBAL and Collab4Safety). This means extra income for the participating SELAMAT members
7. Easy excess to top experts from other parts of the world to help solve food safety issues
8. Support on issues related to food safety legislation in various parts of the world (among others via the SELAMAT food safety legislation portal)
9. Increase of exposure of a SELAMAT partner in its own country via dedicated workshops and training courses. Other SELAMAT partners contribute to these activities and also financial support via SELAMAT is realized (including identifying and contracting top experts)
10. Exchange of personnel and offering sabbaticals and short term laboratories visits for SELAMAT members.
11. Joint scientific publications

ABOUT THE DURBAN UNIVERSITY OF TECHNOLOGY, SOUTH AFRICA

With approximately 23 000 students, the Durban University of Technology (DUT) is the first choice for higher education in KwaZulu-Natal (KZN). It is located in the beautiful cities of Durban and Pietermaritzburg (PMB). As a University of Technology, it prioritises the quality of teaching and learning by ensuring its academic staff possess the highest possible qualification that they can get.

The Durban University of Technology is a result of the merger in April 2002 of two prestigious technikons, ML Sultan and Technikon Natal. It was named the Durban Institute of Technology and later became the Durban University of Technology in line with the rest of the universities of technology.

DUT, a member of the International Association of Universities, is a multi-campus university of technology at the cutting edge of higher education, technological training and research. The university aspires to be a “preferred university for developing leadership in technology and productive citizenship”, and to “making knowledge useful”.

As a butterfly develops from a pupa, so have the students at our institution. From the moment they register as green freshers, to their capping at the hallowed graduation ceremony, our students undergo an intellectual evolution.



Durban University of Technology, South Africa

***Effective and regular
hand cleaning is one of
the best ways to prevent
food borne illness***

PROGRAMME

- | | |
|---------------|--|
| 08.30 – 09.00 | Registration |
| 09.05 – 09.10 | Welcome Address by Prof Suren Singh.
Dean, Faculty of Applied Sciences, Durban
University of Technology. |
| 09.10 - 09.20 | Welcome Address by Dr Hans Marvin,
Wageningen University and Research Nether-
land; Coordinator of SELAMAT |
| 09.20 – 09.30 | Address by Prof S Moyo,
Acting Deputy Vice-Chancellor: Engagement,
Durban University of Technology. |
| 09.30 – 10.00 | Food Safety and Quality in a Globalized
World.
Keynote Speaker: Dr Bart Goossens, FAO. (to
be confirmed) |
| 10.00 – 10.30 | Coffee Break and Photo Session |
| 10.30 - 11.00 | Water use and reuse for agriculture – food
safety challenges
Speaker: Dr Teresa Crespo, IBET |

FIRST SESSION

Theme 1: Food Safety and Control

Chairs: Dr Hans Marvin and Dr Xingang Liu

Time	Title	Presenter	Designation
11.00 – 11.30	Risk-based Regulatory Control of Food Safety – a Veterinary Perspective	Dr Reuben Govender	Directorate of Food Control, Department of Health
11.30- 12.00	Early warning systems of food safety risks	Dr Hans Marvin	RIKILT Wageningen University & Research
12.10- 12.40	Consumer trust and food safety.	Prof Daya Goburdhun	UOM, Mauritius
12.40 – 13.10	Safe food supply and consumption in Africa: Way forward	Dr Obadina Adewale Olusegun	FUUNAB, Abeokuta, Nigeria.

**Discussion and introduction of the afternoon program,
by Dr Oluwatosin Ijabadeniyi**

13.30 – 14.10	Lunch		
14.10 – 14.40	The role of monitoring programs in Food Safety control	Dr Nilson César C. Guimarães	LANAGRO MG, Brazil

SECOND SESSION

Theme 1: New Trends in Analytical Screening

Chairs: Dr Teresa Crespo and Mr Piet Stouten

Time	Title	Presenter	Designation
14.50 – 15.20	Immunoassays of food contaminants: Trends of development and new possibilities	Dr Anatoly Zherdev	RAS, Russia
15.20 – 15.50	Research progress of pesticide residue analysis technique	Prof Xingang Liu	IPP CAAS, China
16:20- 16.10	Discussion and overall conclusion, by Dr Hans Marvin & Dr Teresa Crespo		
16.20- 16.30	Vote of Thanks by Prof Kugen Permaul (Head of Department, Biotechnology and Food Technology, Durban University of Technology)		
16.30	End of program & Refreshments		

BIOGRAPHY OF DR TERESA CRESPO



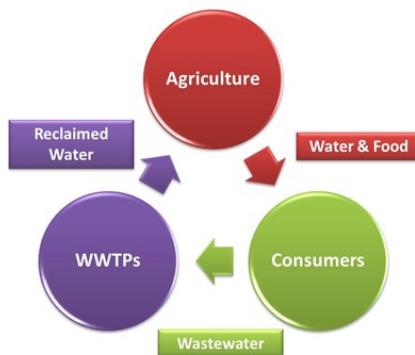
Dr Maria Teresa Barreto Crespo, PhD in Biological Engineering, Senior Researcher at iBET and Head of the Food Safety and Microbiology at iBET. Has also been Director of the Analytical Services of iBET and ITQB for 9 years (2006-2015) (with certification in Good Manufacturing Practices- Quality Control from INFARMED and DGAV) and is actually Manager of the Quality Assurance Unit of iBET.

Has a long track record as been researcher in charge, more than 20 projects, of both national and international projects (EUREKA, 6FP, 7FP), as well as been participant in projects as researcher. Has large experience of cooperation with agro-industrial companies as well as pharma and biopharma companies.

The area of work in the last 20 year has been microbiology, in particular in microbial characterization and ecology and on pathogenecity/virulence mechanisms of bacteria, in particular *Enterococcus*, *Aeromonas*, and nodulating bacteria. She has dedicated special attention to the areas of food and water quality and safety, food traceability and authenticity and, more recently, in bioremediation processes and water treatments.

Has more than 60 articles in peer-reviewed journals, 9 book chapters in internationally published books and was editor of one book.

She has supervised 7 PhD Thesis and has hosted Pos-Docs in scientific research and in the Artistic Studies.



WATER USE AND REUSE FOR AGRICULTURE – FOOD SAFETY CHALLENGES

Ana Filipa Silva, Frédéric Gaspar, Vanessa Pereira, Maria Teresa Crespo*

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Water is increasingly in the forefront as priority for the world's future. Food and agriculture are the major consumers of Earth fresh water. Irrigation consumes 70% of the water obtained from rivers and groundwater reserves. By 2050 this demand is estimated to increase 19% only due to irrigation needs. Up to 90% of the water withdrawn for domestic use returns to the environment as wastewater. So, the reuse of wastewater is mandatory and is driven by current World water scarcity situations, its nutrient value and because it is seen as a viable economic strategy and, above all, an environmental sustainable practice. Nevertheless, the reuse of wastewater raises public health issues concerning its microbiological quality and safety for the general public (crop consumers) and farm workers. Many legislation concerning irrigation water only focuses the analysis of faecal coliforms and intestinal parasite eggs. However, these parameters fail to correlate with the presence of emerging contaminants such as antibiotics (AB), AB resistant bacteria, AB resistance genes and pathogenic viruses, which have a major impact on food safety. WWTPs are often inefficient in eliminating AB resistant bacteria and resistance genes, as well as the ABs themselves. This magnifies the problems associated with AB resistances, in which ABs will be rendered useless if measures are not taken, and ultimately with the public health. Another health hazard in wastewater is the presence of enteric viruses, a large group of viruses with severe impact on human health, causing a large range of symptoms, such as acute gastroenteritis, meningitis and hepatitis. Enteric viruses such as adenovirus, norovirus and hepatitis A viruses are continuously found in wastewater effluents, persisting at high levels, despite the disinfection procedures conventionally applied in WWTP. Fresh produce irrigated with reclaimed water has been described as an important vehicle for the transmission of such viruses. Therefore, safety evaluation of reclaimed wastewater for agriculture irrigation must include the antibiotic resistance problematic and the viral infectious potential.

BIOGRAPHY OF DR REUBEN GOVENDER



Dr Reuben Govender has over 15 years of experience in the field of public health. His research interest includes food safety management and he has authored several papers in food safety. He is a part time consultant involved in the implementation and auditing of management systems with a specialization in ISO 14001 and OHSAS 18001. He is also a legal auditor with an emphasis on Environmental Pollution and occupational health and safety. He holds, amongst others, a B-Tech degree in Environmental Health, a LLB degree, a M-Tech degree in Quality and an Advanced Certificate in Quality Management from the Hochschule für Technik und Wirtschaft des Saarlandes Saarbrücken, Germany.

RISK-BASED REGULATORY CONTROL OF FOOD SAFETY – A VETERINARY PERSPECTIVE

South African control over meat safety is managed by the Department of Agriculture, Forestry and Fisheries (DAFF). Veterinary services department in each of the nine provinces in the country is tasked with overseeing the farm and abattoir segments of the meat supply chain. Abattoirs are privately owned. The number of abattoirs over the years has increased. This increase has placed constraints on government resources required to monitor these abattoirs. Traditional command and control approaches to food control policy now appears ineffective. The inspection of facilities to determine their compliance to food safety legislation is reactive. This paper presents a case for the adoption of risk-based regulation as a method of enhancing government control over hygiene and safe meat processing at abattoirs in South Africa.

BIOGRAPHY OF DR HANS MARVIN



Dr. Hans J.P. Marvin is a senior scientist RIKILT Wageningen Research, The Netherlands. RIKILT is specialized in many aspects of food safety, including analysis of foods, research on safety, and risk assessment for authorities. Dr. Marvin works on a number of food safety issues, including emerging risk, food/ feed issues related to biotechnology & nanotechnology and risk analysis and has initiated various activities within the Netherlands and EU in these fields. Dr Marvin's personal research specialisms are (i) methods for emerging risk identification, (ii) effect of drivers (among others climate change) on food safety, (iii) safety of engineered nanoparticles including stakeholders analysis (among others consumer perception), and (iv) development of decision support systems. On these topics he has organized and chaired numerous workshops and is author and co-author of many publications on food safety.

EARLY WARNING SYSTEMS OF FOOD SAFETY RISKS

Hans Marvin (Wageningen Research (WR), RIKILT)

The complexity of food supply chains make them vulnerable to the development of food safety risks as illustrated by the food safety issues (e.g. BSE, dioxins, GMOs, acrylamide, nitrofurans, Sudan dye and melamine) that have occurred in the past decades. In many parts of the world, early warning systems have been put in place to detect a potential food safety issue at an early stage so that proper actions can be taken. A variety of systems have been developed which can be divided into reactive systems (based on hazard- or symptom monitoring) or proactive systems that are based on a holistic approach. To demonstrate the differences we will discuss in more detail the reactive systems Rapid Alert for Food and Feed (RASFF) and MedISys, both developed in Europe, and new initiatives that aim to develop holistic based prediction systems for food safety hazards.

BIOGRAPHY OF PROF DAYA GOBURDHUN



Prof Daya Goburdhun has been lecturing in the area of food science and technology for over 25 years. Her research interests are in food safety, postharvest technology, food composition and nutrition. Many of her projects have dealt with assessment of hygiene prevailing in educational institutions, food safety education and consumer behaviour in food safety. She has co-authored several publications

on the food control system in Mauritius. She is very keen to disseminate knowledge through organization of several short courses for the food community. She has also mounted workshops on topics such as food dehydration and risk analysis for food safety. She is the Chairperson of the Food and Agricultural Standards Committee of the Mauritius Standards Bureau, which oversees the development of standards for agricultural and food products. Daya is a member of the EDES – Food Safety Steering Committee, which is committed to strengthening the food control system in Mauritius. She is currently the Head of the Department of Agricultural and Food Science at the Faculty of Agriculture, University of Mauritius and represents the institution on the SELAMAT consortium.

CONSUMER TRUST AND FOOD SAFETY

Daya Goburdhun, Faculty of Agriculture, University of Mauritius
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The food market is very complex and consumer trust in food plays a key role in food choice and purchasing decision. While consumers are demanding healthier and safer foods, recent food scandals have shaken consumers' trust in the food system. Mauritius is a net food importer and therefore is exposed to the impacts of these food scandals indirectly. In 2016, the food industry experienced two animal related incidents in Mauritius: Foot and Mouth Disease in cattle and goat and Salmonella in chicken almost during the same period. This proved to be a hard experience for food manufacturers, retailers and regulators while at the same time rocking consumers' trust on food safety. This paper provides an insight of factors that may increase or decrease consumers' trust in the food system particularly the safety of foods. It also proposes some measures to build consumer trust in the food system.

BIOGRAPHY OF DR ADEWALE OBADINA



Dr Adewale Olusegun Obadina, PhD is the Director of Biotechnology Centre and lecturer in the Department of Food Science and Technology, Federal University of Agriculture, Abeokuta, Nigeria. He is a grantee and Research Associateship Fellow of The World Academy of Sciences (TWAS) with research interest in Food Safety and Quality. Dr. Adewale obtained his Bachelor degree in 1998, Masters and Ph.D degrees in 2002 and 2006 respectively from the Federal University of Agriculture, Abeokuta, Nigeria. He

began his lecturing career at Bells University of Technology, Ota, Nigeria in 2005 in the Department of Food Biotechnology and later became the coordinator for the Department of Food Science and Technology. In September 2009, he left for the Federal University of Agriculture, Abeokuta (FUNAAB), where he continued his esteemed career as Food Quality/Safety researcher and lecturer. He was a visiting scholar for an EU Erasmus Mundus M.Sc. programme at Katholie University, Gent, Belgium and Dublin Institute of Technology, Ireland to teach Courses on Food Safety and Food Nutrition. He was also a Visiting Lecturer at Department of Food Biotechnology and Food Technology, University of Johannesburg, South Africa under the DAAD Academic Exchange Programme. Dr. Obadina has been involved as facilitator in different short courses and workshops both within and outside Nigeria. He has played an integral role in various collaborative projects sponsored by international donors such as DFID, EU, Bill and Melinda Gate Foundation, Africa-Brazil Innovation, The World Academy of Science (TWAS) and mentor for My Community, Our Earth (MyCOE) project on *"Effect of climate variability on fresh cut vegetables in South-west Nigeria"* sponsored by AAG, USAID and SERVIR. He is a member of the Global Food Safety Partnership (GFSP) on Curricula sponsored by World Bank and to be executed by International Union of Food Science and Technology (IUFoST). He is a member of the Food Science Advisory Council, Human Health Organization (HHO) also, a member of the Early Career Scientist Section of International Academy of Food Science and Technology (IAFoST-ECS). In all of his professional endeavors, he strives to disseminate optimum knowledge and promote development through innovation and scientific research.

SAFE FOOD SUPPLY AND CONSUMPTION IN AFRICA: WAY FORWARD

Adewale O. Obadina

¹Department of Food Science and Technology, Federal University of Agriculture, P.M.B. 2240, Abeokuta, Nigeria

In a region where food insecurity, political instability, communicable diseases, natural disasters and other major concerns dominate government agendas and the news media, the importance of food safety is often not well understood. However, food safety is of critical importance to Africa because of its aggravating impact over the above listed concerns. A recent survey on food safety status in some Africa countries have helped to note that there is need for more to be done in the following areas: national food safety policy, improvement in food inspection mechanisms, improving laboratory capacity and support service, surveillance with education and outreach on food safety hazards. The concerns over food safety have also been compounded by the increasing urbanisation which can lead to stresses on the emerging urban infrastructure. Livelihoods and consumer health, particularly the urban poor and young, may be at risk if concerns over food safety are not addressed. Unfortunately, the food safety systems in most countries within the region are generally weak, fragmented and not well coordinated. Considering national food production systems, it will be recommended that a food safety management systems approach should be adopted, for example hazard analysis and critical control point (HACCP) and as part of this Good Agricultural Practice and Good Manufacturing Practice so as to improve the safety of food supply and consumption in the continent.

Keywords: Food safety, Food pathogens, HACCP, GAP, GMP

BIOGRAPHY OF DR NILSON CÉSAR C. GUIMARÃES



Dr Nilson César Castanheira Guimarães is an Agronomist, with a Master Degree from the Federal University of Lavras, Brazil (UFLA), with experience in Molecular Biology and GMO detection, and Head of the Technical Division of the National Agricultural Laboratory of the Ministry of Agriculture, Livestock and Food Supply in Brazil since 2012. Nilson coordinates the lab units related to Food Safety, Agriculture Inputs and Plant Diseases and Pests.

THE ROLE OF MONITORING PROGRAMS IN FOOD SAFETY CONTROL

In Brazil, the monitoring programs related to food safety control are led by the Ministry of Agriculture, Livestock and Food Supply in Brasília with an important interface with the official laboratories, since a very important part of the actions supporting these programs are the analyses carried out there. The objective of this lecture is to demonstrate how the Brazilian system is put in place, and how the system is organized in order to cover the huge scope of a country with continental size and a major agriculture production. Besides showing this system and its mechanisms, some data on the size of our market (internal and external), the dimension of our laboratory system and the recent challenges we have been going through will be presented.

BIOGRAPHY OF DR. ANATOLY ZHERDEV



Dr. Anatoly Zherdev is leading researcher of the Centre of Biotechnology, Moscow, and expert of the Russian National Contact Centre "Biotechnology, Agriculture and Food". His scientific interests lie in the field of immunoanalytical techniques for food quality and safety control. He is author of ~150 papers in peer-reviewed journals describing new formats for immunodetection of mycotoxins, veterinary drugs, pesticides, endocrine disruptors and other hazardous compounds. The development of large-scale manufacturing of immunochromatographic strips for on-site analyses was awarded by prize of the Russian government (2010). He participated/s in several international projects covering different aspects of food safety control and food-related risks.

IMMUNOASSAYS OF FOOD CONTAMINANTS: TRENDS OF DEVELOPMENT AND NEW POSSIBILITIES

Anatoly Zherdev

Institute of Biochemistry, Centre of Biotechnology, Russian Acad. Sci., Moscow, Russia

Key words: toxic contaminants, ELISA, immunochromatography, selectivity of immunoassays, nanodispersed labels, enhancement of analytical signals, multiparametric assays, point-of-care testing. Immunoanalytical detection of toxic and pathogenic contaminants in food has clear fundamental advantages: (i) selectivity provided by immune recognition, (ii) possibility to reach extremely low limits of detection, (iii) simplicity of handling procedures. However, its place among alternate analytical approaches and perspectives of wider application are still disputable. Further use of immunotechniques in food safety control will depend both on the development of new assay formats combining rapidity and sensitivity and on production and commercial accessibility of test systems for various contaminants. The report will provide an assessment of recent progress in both directions. The general characteristics of the world market of immunoanalytical systems for the detection of contaminants in environmental objects, agricultural production and food will be given. The assortment of test systems offered by leading manufacturers will be considered. The integration of existing immunoassay systems into chains of food production will be discussed including regulatory and organizational aspects of this integration. Examples of national Russian practice of food safety control will be given. Different formats of immunochemical analysis will be compared, including immunoenzyme assays, immunochromatographic test strips, immunosensors, etc. The approaches used to increase the sensitivity and productivity of immunoassays will be considered. New decisions to improve the information capacity of immunoassay systems will be presented, including multiparametric tests, semi-quantitative and quantitative rapid tests. Trends in the evolution of immunochemical test-systems will be illustrated by examples from the R&D practice of the Institute of Biochemistry.

BIOGRAPHY OF PROF XINGANG LIU



Prof Xingang Liu, Professor, Doctor Supervisor. He got his Ph.D in Applied Chemistry, Tianjin University on March, 2006. And since April, Liu has been working in the Institute of Plant Protection, Chinese Academy of Agricultural Sciences and has mainly researched on Chemical analysis of pesticide residue, the environmental fate of pesticides, etc. He presides over a National Natural Science Youth Foundation, two National Natural Science Foundation and Beijing New-star Plan of Science and Technology. He participated in the EU FP7 project, National Natural Science Foundation, Science and Technology Projects of public welfare industry and Establishment of industry standards, etc. Liu has published over 100 SCI papers, 31 as the first author or the corresponding author and edited 5 books. He has supervised 8 graduate students. Liu won the Guangdong Provincial Science and Technology Award, the second prize in 2013, the Agricultural Science and Technology of China, first prize in 2015, the "top ten youth" of Chinese Academy of Agricultural Sciences in 2016, the "Arowana Outstanding Youth Award" of Chinese Academy of Agricultural Sciences in 2014 and the "young station expert" of Haidian District, Beijing in 2013.

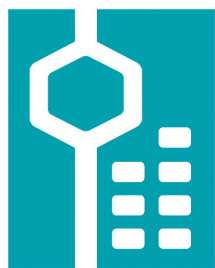
RESEARCH PROGRESS OF PESTICIDE RESIDUE ANALYSIS TECHNIQUE

Analysis technology for pesticide residues plays an important role in protecting the security of agricultural products. With the maximum residue limits (MRLs) being republished by international organizations and becoming stricter, the amount of demanded test item increases. Therefore, high sensitive, high resolution, high anti-interference, rapid methods of residue determination of pesticides are needed to assure food safety of consumers from different countries and promote the exports of agricultural commodities. In recent years, analysis technology for pesticide residues, including pre-treatment methods and detection methods, have achieved a great progress. In the first part of this presentation, some of the techniques and the latest research progress of the pre-treatment methods, including solid phase extraction (SPE), QuEChERS, disposable pipette extraction (DPX), stir bar sorptive extraction (SBSE), Solid-phase micro-extraction (SPME), supercritical fluid extraction (SFE), micro-wave assisted extraction, etc, will be introduced. And in the second part, some classic detection methods, such as gas chromatography (GC), high performance liquid chromatography (HPLC), GC-MS, LC-MS, supercritical fluid chromatography (SFC), capillary electrophoresis (CE), will be reviewed and 4 new screening means of multi-residue determination of pesticides with high sensitive, high resolution, high anti-interference, including GC-MS/MS, liquid chromatography-four stage time-of-flight/mass spectrometry (LC-Q-TOF/MS), high performance liquid chromatography quadrupole/electrostatic field orbital trap high resolution mass spectrometry (UPLC-Q-orbitrap) and Liquid chromatography three quadrupole/linear ion trap mass spectrometry (LC-Q-TRAP/MS) will be presented. Undoubtedly, these new pre-treatment methods and detection methods will contribute to enhancing and improving the amount of pesticide residue analysis and detection techniques. And more and more new technologies and instruments will be applied to the analysis of pesticide residues. Because of the requirement for real-time and rapid detection of pesticide residues, the research on small portable pretreatment equipment and chromatography coupled to tandem mass spectrometry will be the trend of future development. The method of pesticide residue analysis is developing in the direction of simple operation, high efficiency, high accuracy, high sensitivity and good repeatability.



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