

GMASSURE Food Safety Training Workshop

1. Introduction

GMASSURE is an action of the African, Caribbean and Pacific (ACP) Science and Technology Programme that is funded by the European Union (EU) and the Department of Science and Technology (DST) in South Africa.

The action's objective is to assist in increasing agricultural productivity in the Southern African Development Community (SADC) region by improving knowledge about, increasing capacity in agricultural biosafety and biotechnology, and promoting the safe use of genetically modified (GM) agricultural crops. In order to achieve this objective, GMASSURE hosts workshops on a variety of topics.

2. About the workshop

The Food Safety Training Workshop, with particular application to genetically modified organisms (GMOs), was presented at the African Pride Mount Grace Country House and Spa in Magaliesburg, South Africa, from 23 to 25 November 2015. The workshop focused on methods to determine food and nutrition safety in a GMO context, and comprised a combination of lectures, group work and discussions. It was aimed at enhancing the knowledge of stakeholders in biosafety assessment and risk governance, and focused specifically on upgrading the skills of scientists, government officials, farmers, consumers, regulators and other stakeholders in the food value chain, and enabling them to embed much of the knowledge within teaching and research activities in their own organisations. All the presentations are available on the GMASSURE website.

3. Facilitators

The workshop was facilitated by two specialists from the GMASSURE action's partner institution, the Technical University of Denmark (DTU), Dr Ilona Kryspin Sørensen and Dr Morten Poulsen, as well as Dr Wilna Jansen van Rijssen from South Africa.

- **Dr Ilona Kryspin Sørensen** is project coordinator and senior scientist in the Group of Risk Assessment and Nutrition at the National Food Institute of DTU. She holds a PhD in Animal Physiology, and has been Head of the Group of Toxicological Risk Assessment and GMOs at DTU for the past 10 years. She has been responsible for the implementation of molecular biology technology in toxicology and the implementation and development of GMO control methodology and its accreditation. Her duties include evaluating the safety of biotechnology research and development projects, as well as industrial biotechnology projects submitted for approval under the Danish Law on Environment and Genetic Engineering. From 2003 to 2012, she was a member of the GMO Panel of the European Food Safety Authority (EFSA), and served in several EFSA GMO working groups. She is a coordinator of the European Commission's GMO training courses Better Training for Safer Foods (BTSF).
- **Dr Morten Poulsen** is a senior researcher and Head of the Research Group on Risk Benefit Assessments at the National Food Institute of DTU. He holds a master's degree in Biological Sciences and a PhD in Toxicology and Nutrition. He has been deputy coordinator on the EU project for the safety testing of transgenic food (SAFOTEST), where GM rice was constructed, grown and tested in in vitro and animal studies. He specialises in toxicology and the design of animal studies, and has co-authored several guidance documents published by EFSA on the safety assessment of GM food and novel foods. He is currently leading a larger project on the risk-benefit assessment of foods and risk ranking.

- **Dr Wilna Jansen van Rijssen** pursues a career in food safety and risk assessment. She started her career with the Department of Health as a pharmacist with a BSc Honours in Pharmacology, and moved on to the Food Safety Division as Deputy Director, where she was responsible for all aspects of chemical safety, specifically pesticide toxicology assessment. Her responsibilities also included the safety and risk assessment of GM food. After her retirement, she continued to serve as a reviewer and advisor on various committees, including those of the Organisation for Economic Cooperation and Development (OECD). She also served on the Board of the South African Agricultural Research Council (ARC). Her qualifications in Plant Biochemistry (MSc), Toxicology (MSc, Surrey) and Master in Public Administration (MPA) prepared the way for a PhD in the risk governance of GMOs and pesticides. She has published articles in several journals, as well as chapters in books, and is actively involved in training in the risk assessment of food.

4. Workshop programme

DAY 1

The first day of the workshop commenced with an overview of the training course activities by Dr Sørensen. She discussed the programme, explained the general and learning objectives, and highlighted the expectations for the course. This was followed by the morning session, which included two presentations by Dr Poulsen.

Introduction: What is risk and what is risk analysis?

This presentation entailed an introduction to the concepts of risk and risk perception in the context of food safety, and included an introduction to food safety risk analysis by examining the three pillars of risk analysis: risk assessment, risk management and risk communication. The objectives of the session were for the delegates to understand the concepts of risk and hazard; to discuss the importance of risk perception; to acquire knowledge on the three pillars of risk analysis; and to recognise the role of each pillar of risk analysis and the importance of separating tasks among risk assessors and risk managers.

What is risk assessment?

This presentation provided an overview of the four basic steps of risk assessment: hazard identification, hazard characterisation, exposure assessment and risk characterisation. The main differences between a GMO and a chemical risk assessment were presented, and examples were presented of different types of risk assessment. The objectives of the session were for the delegates to understand the differences and similarities between the concepts and risk terminology in the various areas of food safety; and to understand the content, objectives, data requirements and methods of each step in the risk assessment process.

Case studies and open discussion

The afternoon session commenced with a group exercise with case studies. This exercise consisted of an introduction to short texts such as summaries from a risk analysis, where the participants were required to identify the hazard, the risk, the risk manager, the risk assessor and the risk communicator. Finally, groups were formed and a list of case studies was presented. Each group selected a case study on which they would work for the remainder of the course. The objectives of the session were for the delegates to consolidate the concepts they had learned in the theoretical lectures; and to introduce delegates to the case study they would follow for the rest of the week.

The group exercise was followed by an open discussion in which delegates elaborated on their own challenges regarding the risk assessment of GMOs. The objective of the session was for the delegates to openly discuss problems concerning GMO risk assessment in different African countries.

DAY 2

The second day of the workshop consisted of four presentations, followed by a second group exercise.

GMOs and other biotechnologies

Dr Sørensen presented this session, which consisted of a general introduction to GMOs and other biotechnologies, together with an overview of the regulatory status and requirements of GMOs. The objective of the session was for the delegates to get an informed legal framework for the regulation and assessment of GMOs.

Identification of newly inserted genes and gene products: gene expression/suppression

This session was also presented by Dr Sørensen. It consisted of an overview of the molecular assessment of GMOs. The objective of the session was for the delegates to assess the level of documentation that is necessary to evaluate the insertion and expression of new gene products in GMOs.

Compositional analysis of GMOs and the OECD publications

This session was presented by Dr Jansen van Rijssen. It consisted of a discussion of the compositional analysis of GMOs and an introduction to the work of the OECD. The objective of the session was for the delegates to understand the spectrum of key parameters included in the OECD's risk/safety assessment.

Toxicity and allergenicity assessment

This session was presented by Dr Poulsen, who provided an overview of the different steps in toxicity and allergenicity assessment. He also discussed the need for the toxicological testing of introduced gene products and whole GMO foods. The objective of the session was for the delegates to understand how different toxicity and allergenicity investigations can be used in risk assessment.

Group exercise

The second day was concluded with another group exercise, in which participants evaluated toxicity assessment in practice.

DAY 3

The third day of the workshop consisted of two presentations.

Feeding studies (with laboratory and target animals) for the safety and nutritional assessment of food/feed derived from GM plants

The first part of this session was presented by Dr Poulsen. It consisted of the description, design and performance of different types of animal feeding studies and how to interpret the observed findings in the studies. Different views on long-term feeding studies were presented, as well as the compactors used in animal feeding studies. He also examined how to test whole GM crops and nutritionally enhanced GMOs in animal feeding studies.

The second part of the session was presented by Dr Jansen van Rijssen. It focused on wholesomeness animal feeding studies designed for the nutritional assessment of GMOs. The objective of the session was to give delegates an understanding of the strengths and limitations of the different types of animal studies.

Group exercise

This presentation was followed by another group exercise, where delegates were presented with different scenarios. The objective of the session was for delegates to give a critical review of the study report, focusing on the study design, performance and analysis. Following feedback from the individual groups, Dr Poulsen discussed the question of how to compare the risks and benefits of GMOs.

Intended vs unintended effects

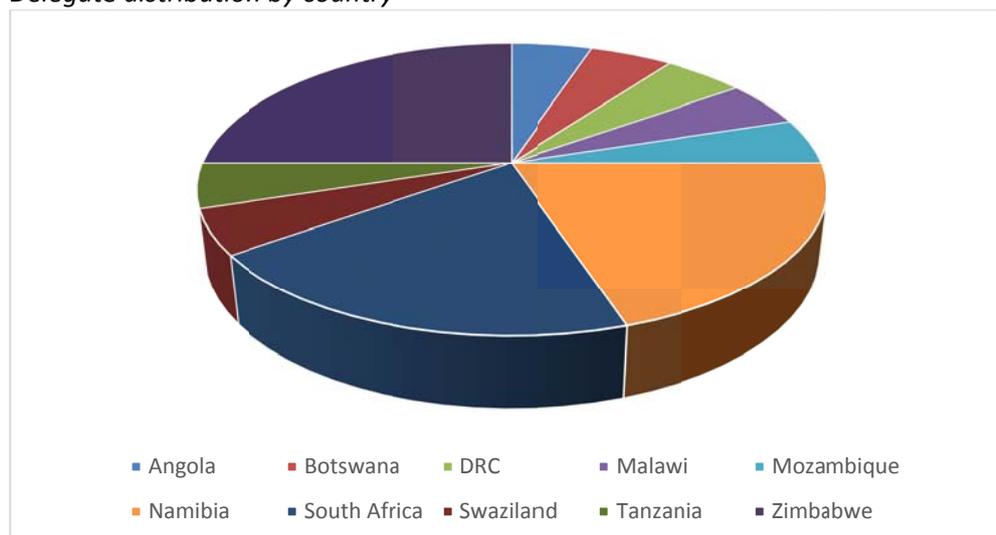
This session was presented by Dr Sørensen. It consisted of an introduction to the concept of substantial equivalence, which is the key tool for revealing unintended effects, as well as a discussion of other parameters such as agronomic and phenotype parameters that are useful for comparisons. The objective of the session was to show delegates how to assess results from comparisons between GMOs and their non-transgenic counterpart.

The day was concluded with specific questions from delegates regarding the issues that were covered in the workshop.

5. Delegates

Some 20 delegates from Angola, Botswana, the Democratic Republic of Congo (DRC), Malawi, Mozambique, Namibia, South Africa, Swaziland, Tanzania and Zimbabwe attended the workshop. Most of the delegates were involved in scientific research and policy making in the field of biotechnology, particularly as it is applied to GMOs and food safety.

Delegate distribution by country



In addition to the delegates hailing from different countries, the following institutions were also represented:

- National Seed Service, Angola
- Ministry of Agriculture, Botswana
- University of Kinshasa, DRC
- Department of Environmental Affairs, Malawi
- Ministry of Science and Technology, Higher Education and Professional Training, Mozambique
- University of Namibia, Namibia
- National Commission on Research, Science and Technology, Namibia
- Biosafety South Africa, South Africa
- Agricultural Research Council, South Africa
- Department of Science and Technology, South Africa
- Swaziland Environment Authority, Swaziland
- Tropical Pesticides Research Institute, Tanzania
- Zimbabwe Farmers' Union, Zimbabwe
- International Crops Research Institute for the Semi-Arid Tropics, Zimbabwe
- National Biosafety Authority, Zimbabwe
- University of Zimbabwe, Zimbabwe

6. Delegate feedback

Upon conclusion of the workshop, the delegates were asked to evaluate the conference in terms of the logistics and administration, venue, content, delivery methods and quality, the presenters, visual aids used, the length of the workshop and the level at which the workshop was presented.

With the exception of some logistical problems experienced by those travelling from Zimbabwe, the delegates were very satisfied with the travel and accommodation arrangements. The venue was excellent, and the delegates enjoyed the beautiful surroundings.

As far as the workshop content was concerned, comments varied from being overly satisfied, to finding the content too technical. Some delegates experienced problems linking the topics, and felt that the information could be better assimilated if more time was spent on lectures, and also if there was greater opportunity for questions.

With regard to the delivery methods and quality of the workshop, the responses of delegates also varied. Some felt that the pace was affected by limited time, that the content was good and relevant, and that more time was needed for those unfamiliar with the content to grasp certain difficult concepts. Other delegates felt a need for more role-play and group activities, that the presenters should have encouraged participation to a greater extent, and that more local (southern African) examples should have been used.

The delegates perceived the presenters to be excellent and very knowledgeable about their field of specialisation, but felt that they could have improved on their delivery of the content, and could have devoted more time to questions. In terms of the presenters' use of visual aids, the delegates' evaluation was varied, with three delegates noting the acoustics as not being satisfactory, but other than that, the majority of the delegates were satisfied with this element of the workshop.

Finally, with regard to the length of the workshop and the level at which the workshop was presented, the responses were also varied. Most felt that the length of the workshop (three days) was satisfactory, while four delegates felt that it was too short. The majority of the delegates were satisfied that the workshop was presented at an intermediate level, while three felt that it was too basic, and two felt that it was too advanced.

In general, the delegates felt that they benefitted from the networking opportunities and the chance to learn first-hand from professionals. They enjoyed the interactive nature of the workshop, found the case studies to be interesting, and experienced the presenters as being competent, very helpful and open to questions. When asked if there was anything that could be improved, some delegates considered the content to be very intensive in terms of the amount of information that was communicated in such a short space of time. Others would have liked to receive content that was of greater relevance to small-scale farmers, more time to fully assimilate the subject matter, and more field sessions. They also felt that some of the subject areas were not related to Africa, and would have benefitted from more African facilitators.

A number of specific comments and recommendations included the following:

- “We learnt a lot about the EU regulatory frameworks and were able to compare this to the situation in South Africa.”
- “We were able to identify the strengths and weaknesses of our current system in South Africa.”
- “By giving us all the facts about GM foods, the presenters were able to demystify the whole concept of GMOs.”
- “Learning from such professional tutors expands one’s knowledge base and understanding of GMOs. It is vital for regulators to be knowledgeable so as to make informed decisions and disseminate consistent and scientifically proven methods to the public and policy makers.”
- “The workshop was very informative, especially for new colleagues dealing with GMOs.”
- “The information presented at the workshop was excellent and state of the art.”

7. Conclusion

The GMASSURE Food Safety Training Workshop held at the African Pride Mount Grace Country House and Spa in Magaliesburg, South Africa, from 23 to 25 November 2015 aimed to equip researchers and policy makers from SADC with information on methods to determine food and nutrition safety in a GMO context. The workshop comprised a combination of lectures, group work and discussions. It was aimed at enhancing the knowledge of stakeholders in biosafety assessment and risk governance, and focused specifically on upgrading the skills of scientists, government officials, farmers, consumers, regulators and other stakeholders in the food value chain, and enabling them to embed much of the knowledge within teaching and research activities in their own organisations.

Feedback received from the delegates indicated that they benefitted from the workshop, and although some felt that the amount of information that was communicated was too much for such a short space of time, the delegates were generally grateful for the opportunity to learn first-hand from professionals in the field, and enjoyed the interactive nature of the workshop. They learnt a lot about the EU regulatory frameworks, and believed that the presenters had succeeded in demystifying the concept of food and nutrition safety in a GMO context.

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Participants' evaluation of the workshop

Fourteen out of twenty participants (70%) responded to the evaluation questionnaire, their responses and comments are outlined below.

On a scale of 1-5 where 1 is **strong disagree** and 5 **strongly agree** the participants rated the following:

1. Logistical and administrative arrangement of the workshop was good	1	2	3	4	5	Did not respond
			1	4	9	

Comments:

- appreciate if someone met them at hotel
- Zim. team had hassles at airport
- excellent except of the travel arrangements
- avoid AirZim
- excellent

2. Workshop venue was:	1	2	3	4	5	Did not Respond
Comfortable				2	12	
Well located			3	2	8	1
Food and refreshments good		1	1	2	9	1

Comments:

- perfect venue & service,
- most ideal venue, quiet, remote venue,
- monotonous food,
- excellent venue,
- beautiful & amazing food, thank you,
- excellent venue but too far from everything, meals could be improved, Gala dinner better quality

3. Workshop content was	1	2	3	4	5	Did not respond
Relevant				8	6	
Comprehensive			2	8	3	1
Easy to understand			5	2	6	1
Objectives were clear			2	6	5	1

Comments:

- overallly satisfied,
- too technical,
- had problems linking topics (cohesion),
- information could be assimilated better if more time spent on lectures, especially questions

4. Delivery methods and quality	1	2	3	4	5	Did Not Respond
The workshop was well structured to achieve the learning outcomes (there was a good balance of lectures, activities, role plays, etc.)		1	4	6	3	
The learning and teaching methods encouraged participation		1	3	5	5	
The workshop stimulated my interest and thought on the subject area.		1		5	8	
The pace of the workshop was appropriate		1	5	4	4	
Ideas and concepts were presented clearly		1	3	6	4	

Comments:

- pace affected by limited time,
- good & relevant content,
- more time needed to grasp concepts for new comers,
- increase role play and group activities,
- need to encourage participation,
- use local examples,
- field visit,
- some speakers lacked confidence in subject area,
- devote more time to questions Increase the time for discussion,
- some activities had very limited time allocation especially group work.

5. The presenters were	1	2	3	4	5	Did Not Respond
Good communicators		2	3	5	4	
Knowledgeable on the topics			1	4	9	
Well prepared			2	5	7	
Responsive to participants' questions			3	2	8	1

Comments:

- excellent presenters,
- needed more time,
- presenters know the subject but need to improve on delivery,
- devote more time to questions

6. The respondents rated the visuals and acoustics as follows;

	Excellent	Very Good	Good	Fair	Poor	Did not respond
Visuals			1	3	5	1

Acoustics	1	2	3	5	5	1
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7. On the length of workshop the following were the response;

Was too Short	Had the right length	Was too Long
	10	4

8. On the length of the level of the workshop the participants felt:

Level	Introductory	Intermediate	Advanced
Number of participants	3	7	2

Two participants felt that the workshop was both intermediate as well as introductory.

9(a) Participants said they liked best the following;

- chance to learn first-hand from professionals
- networking
- risk analysis and assessments for individual crops
- results showing that GM foods are safe
- very relevant concepts in-line with workshop objective
- interactive nature
- case studies interesting
- presenters were excellent, very helpful, open to questions
- pace was fair
- venue was tops
- group discussions with people from different countries
- rich content
- new targeted information
- topics dealt with
- very competent facilitators

(b) The participants responded they liked least the following

- too short time
- too packed
- lack of relevance to small scale farmers
- elaborate on lobbying and advocacy
- nothing x3
- some subject areas not related to Africa, more African facilitators
- not enough time to fully assimilate subject matter
- no way forward for implementation in home country
- venue too far from shops, could not buy airtime
- acoustics
- absence of field sessions

One respondent did not answer this part of the evaluation.

(c) On how the workshop could be improved the respondents said the following:

Content:

- give participants to present before the workshop to stimulate more participation
- more information on cotton
- fine
- satisfied
- field visit
- use of local examples
- more time on experience sharing and group discussion
- unpack jargon
- content would have be more useful with examples from RSA
- include more advanced topics if possible
- more African content
- provide more time, felt rushed
- more specific content e.g. GMO for food and feed only not GMOs in general
- an introduction and situation analysis in the region, some who were attending for first time not too clear on issues out there
- make it less scientific

One respondent did not answer this part of the evaluation.

Visuals:

- satisfied
- OK
- clear visuals though audibility was restricting most times
- no comment
- poor sound x2
- good visuals, sometimes difficult to understand due to poor sound
- good slides
- no need for improvement
- fine

One respondent did not answer this part of the evaluation.

Activities:

- satisfied
- increase group and individual activities so as to assess if message is getting through
- enhance much of discussion
- include field visit
- mock data sets for participants to evaluate
- more practical exercises would be nice
- field visit to relevant institution, use local examples
- more activities would make workshop more interesting
- fine
- field session could improve workshop
- more hands on where participants report back and gain confidence in defending issues

Facilitators:

- satisfied

- perfect and more knowledgeable of content but should improve on lecture delivery, make it more interactive
- knowledgeable, need more time for beginners
- really good
- speak a bit louder
- some must demonstrate more confidence in subject matter
- improve audibility
- well prepared
- fine
- excellent except Morten tended to go very fast sometimes given that he was conveying new concepts

One respondent did not respond to this part of the evaluation.

Other general comments to improving the workshop:

- time allocated was too short for intended work
- well done Ella
- The mode of transport that some of us used could have been improved resulting in a less stressful journey both incoming and outgoing. For example leaving at the crack of dawn just so we could get to the venue and sit on a bench waiting for rooms to be available and check in mid-afternoon; and the outgoing journey was the same, where we waited all day at the airport for the flight back home. While UP has a policy on obtaining three quotations and using the cheapest I doubt if the UP staff would travel this way. I deplore the condescending attitude in this case.

10. Thirteen of the respondents said they would recommend this workshop to a colleague for the following reasons:

- there is a lot to learn about food safety with reference to GMOs
- useful for well-rounded understanding of food safety in general & GMOs specially
- content was good, facilitators excellent, venue beautiful, nice to meet other participants from Africa & interact
- learnt a lot about EU regulatory frameworks & was able to compare with RSA system, was able to identify strengths and limitations of our current system in RSA
- so that we can have facts about GM foods, to demystify the whole concept of GM foods
- learning from such professional tutors expands one's knowledge base & understanding of GMOs. It is vital for regulators to be knowledgeable so as to make informed decisions and disseminate consistent & scientifically proven methods to public & policy makers
- so one can make objective estimates of risk to consumer health and to the environment
- workshop very informing, especially for new colleagues dealing with GMO applications on a daily basis, gave an overview of how to conduct risk assessments
- good workshop details speaking to theme
- excellent materials and the state of the art information was delivered
- enhances GMOs knowledge

One respondent did not respond to this part of the evaluation.