

1 Identification

1.1 Session ID

160407

1.2 Session Title

Focus on Reducing Animal and Plant and Soil diseases to improve One Health and food security.

1.3 Session Date and Time

16 September 2024 at 07h00 ET

1.4 Convenor name

Dr Mirinda van Kleef

2 Speakers and Panelists

Please list all speakers and panellists, including their names, titles, and organisational affiliations.

2.1 Speaker 1

2.1.1 Name: Dr Lia Rotherham

2.1.2 Organisation name: Agricultural Research Council – Onderstepoort Veterinary Research

2.1.3 Type of organisation: Parastatal

2.1.4 Title of the presentation: Are we learning from past disease outbreaks, is a one health approach truly applied?

2.1.5 Summary of the presentation (max 200 words):

Africa has seen several emerging and re-emerging infectious diseases over the last decade which have posed a serious public health challenge to most countries on the continent, due to the complex local and ecological factors that favour their occurrence and spread. Response plans to diseases like SARS-CoV-2 and avian influenza have highlighted areas for improvement within the continent to decrease the threat of spread of these diseases. Most rapid response plans are geared towards animal and human health and the environment is largely overlooked. This has huge implications in some disease outbreak situations where pathogens can be maintained in the environment which could result in pathogens becoming endemic. Endemic pathogens have huge implications for food security as it not only has an impact on food supply but livelihoods. Are we learning and is the one health approach being applied?

2.2 Speaker 2

2.2.1 Name: Dr Ansa van Vuuren

2.2.2 Organisation name: Agricultural Research Council – Plant Health and Protection

2.2.3 Type of organisation: Parastatal

2.2.4 Title of the presentation: The importance of quarantine and certification schemes to ensure healthy plants

2.2.5 Summary of the presentation (max 200 words):

The process of plant improvement aims to improve the characteristics of a plant or a crop relating to yield, quality and health status. Part of this process involves the multiplication of plant material that is free of economically important pests and diseases. Participation in a certification scheme, provides assurance to growers that the plant material's trueness to type, disease status and physical quality have been independently confirmed. The health status of propagating material is determined by testing and visual examination. Testing is the only way to ensure freedom of viruses and viroids, while visual examination is sometimes enough to detect certain pests and diseases.

To ensure market competitiveness, intellectual property owners, plant improvement organisations and seed houses often import and export plant material. Plant quarantine services is a compulsory function, often managed by the government, where plant certification schemes can be voluntary or compulsory depending on the country or crop. It is important to ensure that there is clear delineation between the various functions within the plant improvement processes and that there is sufficient capacity and mandate within a country to ensure that the healthiest plant material possible is planted.

2.3 Speaker 3

2.3.1 Name: Dr Chatelle Girgan

2.3.2 Organisation name: Agricultural Research Council - Plant Health and Protection

2.3.3 Type of organisation: Parastatal

2.3.4 Title of the presentation:

2.3.5 Summary of the presentation (max 200 words):

Soil health is defined as the capacity of soil to function as a vital living system, within ecosystem and land-use boundaries, to sustain plant and animal productivity, maintain or enhance water and air quality, and promote plant and animal health. Soil is a living system and the foundation of crop production and therefore needs to be monitored closely. The biotic and abiotic aspects of soil need to be in balance to be defined as a healthy soil system. Therefore, both these aspects of soil can also be used to determine the soil health status of a system. Often the focus is on soil diseases and pests, however beneficial organisms can give insight into the health of a soil ecosystem. Soil organisms including bacteria, fungi and nematodes, play an important role in the soil ecosystem and are frequently used as biological indicators of soil health for various reasons. Biological indicator organisms play important roles in nutrient cycling and mineralisation in soil ecosystems. They also form part of the soil food web as primary consumers and secondary

consumers (of organic matter and other organisms). These organisms react rapidly to environmental change and are therefore well suited for monitoring soil health.

2.4 Speaker 4

2.4.1 Name: Prof Darrell Abernethy

2.4.2 Organisation name: Aberystwyth University

2.4.3 Type of organisation: Academic University

2.4.4 Title of the presentation: One Health in Research and Policymaking: Useful Convenience or Essential Collaboration?

2.4.5 Summary of the presentation (max 200 words):

One Health is a cooperation of multiple disciplines, at all levels of government and society, to optimize the health of animals, people and the environment. Strongly endorsed by WHO, WOA, FAO and UNEP in their 2023 One Health Joint Plan of Action, it should be the cornerstone of research development and policymaking. But is it? And if not, why not? In this presentation, I will explore how a One Health approach can impact these critical areas, drawing on examples from my experience in endemic zoonotic disease control, epizootic disease eradication and the conservation of endangered wildlife. I will discuss barriers to progress, from within veterinary and medical education, through policy development and implementation, to research calls and actions. I will demonstrate that a paradigm shift is required to break silo approaches and ensure One Health thinking becomes ingrained as “normal” rather than an optional extra.

2.5 Speaker 5

2.5.1 Name: Prof Cecilia Onyango

2.5.2 Organisation name: University of Nairobi

2.5.3 Type of organisation: Academic University

2.5.4 Title of the presentation: Plant Health: A Critical Component of One Health and Food Security

2.5.5 Summary of the presentation (max 200 words):

Presentation highlighted the fact that plant health management is a critical component of One Health.

2.6 Speaker 6

2.6.1 Name: Dr Samiran Banerjee

2.6.2 Organisation name: North Dakota State University

2.6.3 Type of organisation: Academic University

2.6.4 Title of the presentation: The Role of Soil Microbiomes in One Health

2.6.5 Summary of the presentation (max 200 words):

Microbial communities inhabiting plants, animals and humans act as a second genome, an extended genotype or an eco-holobiont, and thus drive the fitness and performance of almost all organisms on Earth. The one health concept underscores how human health is intimately connected to the health of animals, plants, and environments. Recent studies have also shown that microbial communities of different organisms are interconnected and form a circular loop. However, compared to plant, animal and human health, the appreciation for the soil microbiome and soil health remained understudied. Soils act a foundation of one health and serve as a source and reservoir of pathogens, beneficials and the overall microbial diversity in ecosystems. There are numerous soil microbiome functions that either directly or indirectly contribute to animal, plant, human and ecosystem health, which further underscore that soil, plant, and human microbiomes are perhaps more interconnected than previously thought. Indeed, there are a range of microbial groups that not only inhabit the soil but also play a role in animal/human health. Such reports highlight that soil microbial contributions to one health must be understood and systematic monitoring tools are required to evaluate the trends, threats, and long-term developments of the soil microbiome.

3 Content

3.1 Session Abstract (max. 500 words)

One Health is an integrated approach that aims to sustainably optimize the health of people, animals, plants and ecosystems. Microbes continuously adapt, change, and find new niches with increasingly unique opportunities to cross species lines, resulting in emerging and re-emerging diseases of humans, animals and plants. Increased movement and intermingling of humans and animals also contribute to health risks, spread of disease and incidence of zoonotic diseases. The world population is currently estimated to be 8 billion and expected to reach 9.8 billion in 2050. Each year approximately 80 billion animals are slaughtered for meat, 9.4 billion tons of crops are produced, and 33 percent of croplands are used for livestock feed production. It is also estimated that 820 million people, globally, suffer food insecurity and are undernourished. This can be increased by threats to crop, soil, animal and human health. Action must therefore be taken to improve and protect food security. Proactive measures for disease prevention such as vaccine development, disease surveillance and early detection will strengthen defences against disease. In addition, training, capacity building, material and information sharing, and timeous disease occurrence

reporting will assist in assuring a successful One Health approach to ensure food security. Thus, this One Health topic is in alignment with two sustainable development goals (SDG) of Zero hunger (SDG 2) and Good health and well-being (SDG 3).

This session will showcase the contributions of the ARC and international delegates towards One Health to improve food security. A panel discussion will follow on future prospects for improving One Health with regards to good health and food security.

3.2 Project Objectives

List the key objectives your session or project aimed to achieve.

3.2.1 Objective 1 (max 50 words)

Reducing Animal and Plant and Soil diseases to improve One Health and food security

3.3 Key Themes

Main themes and topics that were covered during the session. The same ones you selected when you submitted your original session proposal. Select from the following. Maximum three

- **One Health**

4 Planned Impacts of the science and innovation presented in you session

4.1 Contribution to the SDGs

The SDGs provide a comprehensive framework for addressing the world's most pressing challenges and promoting sustainable development globally. Select the Goal/s that your project contributes to (max 3 SDGs)

2. **Zero Hunger:** End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.
3. **Good Health and Well-Being:** Ensure healthy lives and promote well-being for all at all ages.

5 Contribution to the UN Summit of the Future

5.1 Main challenges (max 200 words)

Main challenges and difficulties experienced in implementing the science to contribute to the Sustainable Development Goals and provide recommendations to address the same whole.

The main challenges and difficulties experienced in implementing the science to contribute to zero hunger and good health and well-being are: People work in silo's, experience loss of expertise, education of people on One Health is failing, too little funding and access to resources in all areas of One Health implementation, there is not a buy in and standardisation of plant certification worldwide, inability to move from principle to practice, climate change decreases agricultural productivity and leads to increase of diseases, inadequate monitoring systems and lack of implementation of policies.

Recommendations to ensure a future in One Health are: to ensure that soil microbiome is diverse to ensure that dangerous pathogens are not abundant, educate people that healthy soil = healthy plants = healthy animals = healthy humans, train people adequately, increase funding opportunities, ensure technology access and improved infrastructure, address mitigators of climate change, need common goals globally for One Health to succeed, ensure that there are good case studies as examples to convince people of the importance of One Health.

5.2 Additional goals (max 200 words)

Additional goals, beyond the Goals, which are considered priorities

5.3 Integration: economic, social and environmental (max 500 words)

The steps being taken to integrate the three dimensions of sustainable development (economic, social, and environmental) and share best practices where available and how activities are being designed and implemented to reflect such integration.

One Health is an integrated approach that aims to sustainably optimize the health of people, animals, plants and ecosystems. One health strategies that include the three dimensions of economic, social, and environmental must be continued. The health, agriculture, environment and finance sectors must strengthen collaboration and coordinate their planning and actions accordingly. Adequate funding initiatives between public and private partnerships must be actively sourced to support interdisciplinary research and public awareness campaigns and education required to enhance one health. This will lead to conservation of natural resources (environmental), increased food security (social) and agricultural productivity (economic).

5.4 Impact on the 2030 Agenda (max 1000 words)

A success metric for your project is primarily in how it delivers for all persons in our societies. Describe how other principles of the 2030 Agenda, for example, respect for all human rights, gender equality, the principle of Leaving No One Behind, non-discrimination, etc, have been mainstreamed in your science project.

More info on: 2030 Agenda: <https://sdgs.un.org/2030agenda>

Please select also the transition relevant to your science project:

(1) food systems; (2) energy access and affordability; (3) digital connectivity; (4) education; (5) jobs and social protection; and (6) climate change, biodiversity loss and pollution

More info on Six transitions: <https://unsdg.un.org/sites/default/files/2023-09/Six%20Transitions%20English.pdf>

One Health aims to sustainably optimize the health of people, animals, plants and ecosystems. If its aims are brought to fruition, it will ensure food security to all humans without discrimination.

6 Forward-looking Statement

6.1 Financial aspects

Why giving \$ 1 million to your project will turbo boost the achievement of the SDGs.

Three bullets (50 words/bullet).

6.2 To further advance your science project, you will need:

Please select an option and develop it further (50 words). Multiple selection is possible.

- **Access to Funding**
- **Skilled Personnel**
- **Open Access to Data**
- **Access to Resources** (laboratory facilities, research tools, and technology).
- **Establish Partnerships and Collaborations**
- **Dissemination and Communication activities**
- **Enhance the Regulatory Environment** that supports research initiatives.
- **Access to Market**
- **Advanced Technology**

7 Conclusions (max. 300 words)

Provide a concluding summary on how science contributes to achieving the SDGs, incorporating policy recommendations.

Highlight any new or emerging issues identified during the session, suggest possible next steps or areas for further research and discussion, and outline the support needed to advance science and innovation in your field.