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Extended Abstracts

4th International Conference of Agricultural Sciences



Faculty of Agricultural Sciences
Sabaragamuwa University of Sri Lanka

2022

**4th International Conference of Agricultural Sciences
(AgInsight 2022)**

Sabaragamuwa University of Sri Lanka

“Empowering Research for Innovative and Sustainable Agriculture”

26th and 27th January, 2022

Extended Abstracts

AgInsight 2022

Faculty of Agricultural Sciences,

Sabaragamuwa University of Sri Lanka,

PO Box 02, Belihuloya, Sri Lanka. 70140

Proceedings of the 4th International Conference of Agricultural Sciences 2022

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4th International Conference of Agricultural Sciences
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“Empowering Research for Innovative and Sustainable Agriculture”

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Thematic Areas

Agribusiness and Agricultural Economics
Agriculture and Agri-Environment
Livestock and Aquaculture

**Faculty of Agricultural Sciences,
Sabaragamuwa University of Sri Lanka,
P.O. Box 02,
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Keynote Address

Professor Andrea S. Cupp

Animal Reproductive Innovations During Pubertal Attainment to Increase Animal Protein

Andrea S Cupp¹, Sarah Nafziger¹, Mohamed A. Abedal-Majed², Jessica Keane¹, Jeff Bergman¹, Scott Kurz¹, Adam Summers²



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The world population is predicted to increase from approximately 7.9 billion in 2020 to 9.9 billion in 2050. In order to feed the world's population, innovation in how animal protein is produced need to be enhanced to ensure enough food for the world's growing population. Increased beef, dairy and production of small ruminants, and poultry will need to be produced in a sustainable manner to meet an ever-changing climate. Females that achieve earlier puberty respond to synchronization of estrous cycles, have offspring sooner, and are retained in the herd which enhances their reproductive longevity. These early puberty females are more cost effective since they can repay their development inputs and contribute to increased productivity for the producer. Heifers with earlier puberty have greater reproductive tract scores, respond to synchronization and artificial insemination with greater numbers that calve in the first 21 days of breeding compared to heifers that have delayed puberty. Heifers with delayed puberty have greater numbers of monocytes, and red blood cell parameters that also indicate inflammation and/or decreased liver function. Because attainment of puberty is affected by genetics and environment, we are evaluating differences in temperature, moisture, and drought to determine impact on pubertal attainment. Initial genome wide association studies identified loci contributing to phenotypic variation in genes involved in inflammation, ovulation, neuronal activity, and oxidative stress. Also, whole genome sequencing (WGS) of heifers identified SNPs in genes involved in follicular development, and puberty and are determining how these SNPs segregate among puberty classifications. The use of this genomic and environmental data would allow for better management of heifers for earlier puberty resulting in greater profitability and sustainability of cow/calf operations world-wide. This information could also be transferred to other livestock species to promote increase production of animal protein necessary to feed a growing world population.

**Message from the Vice Chancellor
Sabaragamuwa University of Sri Lanka**

Professor Udaya Rathnayaka

It gives me a great pleasure to extended my heartiest congratulations for the 4th International Conference of the Faculty of Agricultural Sciences Sabaragamuwa University of Sri Lanka (AgInsight 2022) under the theme of “Empowering Research for Innovative & Sustainable Agriculture”. As one of the pioneering faculties of the university, Faculty of Agricultural Sciences has always boldly harbored its academic responsibility and this is indeed a historic milestone of the faculty.



When consider the complexity of the issues that we deal today, what we learn together and the way we share the new knowledge among academia and industry, is important to foster breakthrough ideas that will help in addressing such issues. This conference would provide ample opportunity for sharing knowledge generated through such latest research which is critical in enhancing the well-being of humans, while reviving the global economy in the midst of the present global pandemic.

Organizing an international conference is a big challenge and it has now become more difficult due the global Covid – 19 pandemics. However, I am confident that the Faculty of Agricultural Sciences will hold this conference to meet the global standard.

I extend my sincere thanks and congratulations to the organizing committee, keynote speakers, paper presenters and the participants of the conference and wish them all success.

Prof. Udaya Rathnayaka

Vice-Chancellor

Sabaragamuwa University of Sri Lanka

**Message from the Dean
Faculty of Agricultural Sciences**

Prof. P.M. Asha S. Karunaratne

I am delighted to issue this message to the proceedings of the 4th International Conference of the Faculty of Agricultural Sciences (AgInsight 2022) as the Dean of the Faculty of Agricultural Sciences of the Sabaragamuwa University of Sri Lanka.



The Conference is organized around the theme of “Empowering Research for Innovative and Sustainable Agriculture”. Today, the world is changing rapidly and the problems observed in the agricultural sector are more complex than those in the past. We need multidisciplinary approaches on a global scale in order to solve these problems.

The aim of bringing together both the local and international researchers from different agricultural disciplines to a common platform is evident in this conference. Organizing such an event during this pandemic situation reinforces our objective of developing an environment of exchange of ideas towards the development of the agriculture sector.

The hard work and dedication of all the members of organizing committees during the preparation for this conference is highly appreciated. Without them the event would not have been possible.

I extend my best wishes for the success of the conference.

Prof. P.M. Asha S. Karunaratne

Dean/Faculty of Agricultural Sciences

Sabaragamuwa University of Sri Lanka

Message from the Conference Chair

Prof. Ruvini K. Mutucumarana

On behalf of the Organizing Committee, it is a great honour and privilege to me to extend the welcome message to the 4th International Conference of Agricultural Sciences (AgInsight 2022). To avoid the devastating impact of Covid 19 global pandemic on public health and societies around the world, this time AgInsight 2022 organized by the Faculty of Agricultural Sciences, Sabaragamuwa University of Sri Lanka will be held as a virtual conference on 26th and 27th January 2022, at the premises of the Faculty of Agricultural Sciences in Belihuloya, Sri Lanka.



Aligned with the theme ‘Empowering Research for Innovative and Sustainable Agriculture’ AgInsight 2022 proudly presents more than 100 extended abstracts representing diversified fields of Agribusiness & Agricultural Economics, Agriculture & Agri-environment and Livestock & Aquaculture. AgInsight shares and disseminates research outcomes from the national and international Universities to a wider global community and will get together both academics, industry professionals and research students to a common platform. AgInsight 2022 will show a brilliant path and unerring direction for future research. I wish two plenary sessions would be able to address and discuss the most argued themes of the agriculture and livestock sectors at both national and global levels.

On behalf of the AgInsight 2022 Organizing Committee, I would like to extend my heartfelt gratitude to the Vice Chancellor of Sabaragamuwa University of Sri Lanka, the Dean of the Faculty of Agricultural Sciences and the former Dean of the Faculty of Agricultural Sciences, Sabaragamuwa University of Sri Lanka for their immense guidance and support offered throughout the process. I would also like to convey my warmest thanks to all the members of the Organizing Committee and all those who worked hard to make AgInsight 2022 a reality and a delightful event especially at a period of an unprecedented global pandemic.

I wish that the AgInsight 2022 will be a tremendous success.

Prof. Ruvini K. Mutucumarana
Chair
4th International Conference of Agricultural Sciences

Plenary Session: Agribusiness and Agricultural Economics

Pandemic and the food security

By Prof. Champika Liyanage, University of Central Lancashire



Covid pandemic has severely hit many spheres of life. Its impact on the global economy, the rapid ways in which it spreads across the global population and the impact it is having on our daily lives is overwhelming. There're a lot of lessons to be learnt along the way, until the pandemic is over (if ever). One aspect is to consider how to build greater resilience in our food systems, so that we have the ability to better endure a crisis in the future (Eldidge, 2020). In the UK, the last major food crisis was during the second world war. During this era, there were government-led 'dig for victory' campaigns which combined growing your own fruit and vegetables with a nationwide mobilization of farmers. A lot has changed since then obviously, as many systems have now been replaced with commodity-based supermarket sourcing system (Sustainable Food Trust, 2020). Many countries, including the UK, now depend on imported food, thus, food chains have become extremely long, which then creates vulnerability in itself to fall apart easily. This was evidence at the start of the pandemic with lack of food supplies in supermarkets leading to major disruptions. Since we are yet to see an end to this pandemic as yet, it's high time we talked about some solutions to address food security issues.

Plenary Session: Livestock and Aquaculture

The Role of Nutrition in Sustainable Livestock Production

By Dr. Walter Samarasinghe, Managing Director of Superfeed (PVT) Ltd.

Nourishment of farm animal contributes approximately 85% of the total cost which is the second highest limiting factor in livestock production. Therefore, nourishment becomes huge challenge in sustainable livestock production. The role of nutrition in sustainable livestock production will be critically discussed and assessed by focusing on following areas relevant to farm animal's nourishment by assurance of sustainable livestock production for food security.



1. Present status of the formulated animal feed industry in Sri Lanka
2. Potentials of the animal feed industry in Sri Lanka
3. Constraints of the animal feed industry in Sri Lanka
4. Strategies/ Remedies of the animal feed industry in Sri Lanka
 - Cost effectiveness of feed production
 - Use of recent advances in feed technology
 - Application of simulation models in animal nutrition
 - Efficient use of nutrition on non-productive functions
 - Protection of the environment and animal farming systems
 - Minimize impacts of nutrition on health, welfare, and productivity
 - Future trends of the animal feed industry in Sri Lanka
 - Creation of appropriate / customize feeding systems based on local resources