

The 11th International Symposium on the Nutrition of Herbivores



ISNH 2023

CONFERENCE PROGRAMME

**04-08 June 2023
Florianópolis
Brazil**

June 4-8, 2023
Florianópolis, Brazil

11th edition

<https://symposium-isnh2023.com.br>



WELCOME

The International Symposium on Herbivore Nutrition (ISNH) is a worldwide gathering of leading scientists, students, industry, extension, and primary producers that addresses various issues related to herbivore nutrition in natural ecosystems or commercial production systems. It is the world's most important scientific forum on this topic, in which the nutrition of domestic and wild herbivores is discussed from the perspective of sustainability, food security, and conservation.

The Symposium was held for the first time in South Africa (1983), later taking place in Australia (1987), Malaysia (1991), France (1995), the USA (1999), Mexico (2003), China (2007), UK (2011) and Australia (2014). In 2018, the 10th and last edition took place in Clermont-Ferrand, France, with ~500 participants from all continents. Unfortunately, due to the Covid-19 pandemic, the sequence of holding a symposium edition every four years has been disrupted. The ISNH is now resumed in its 11th edition in Brazil for the first time in Latin America.

The historical evolution of the different editions denotes the transition from the pure nutrition ecology of the first ones towards a more global contextualization of the role of herbivores in food security as well as issues related to the role of herbivores in greenhouse gas emissions, human food, and human well-being associated with the different production systems. Furthermore, the most recent editions have boldly expanded the spatial scale of herbivory analysis, which now ranges from the genome to the production system.

The Brazilian edition intends to consolidate this evolution by focusing on the emerging debate on the role of herbivores in future food systems in the age of big data and technology. Cutting-edge science is shared in an atmosphere of a broad exchange of outstanding knowledge and cordiality.

Local Organizing Committee



CONFERENCE INFORMATION

WELCOME TO FLORIANÓPOLIS

Magic Island

**For more information and history
about the island:**

<https://guiafloripa.com.br/cidade/informacoes-gerais-sobre-florianopolis/historia>

<https://praias-sc.com/praias-de-florianopolis/>

<https://guiafloripa.com.br/turismo/praias>

<https://educasc.com.br/educacao/bruxas-e-lendas-de-florianopolis/>

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ISNH 2023, 04 - 08 June, Florianópolis Brazil



LOCATION

The symposium will be held in
Florianópolis at Costão do
Santinho Resort!



Praia do Santinho, Estr. Ver. Onildo Lemos, 2505
Santinho, Florianópolis – Santa Catarina, 88058-700



Uber is available throughout the island of
Florianópolis.



If you have a medical emergency, you can call 192
directly.

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SOCIAL EVENTS

Welcome reception

On Sunday 4th, all delegates will be invited at a welcome reception in the hall/ “praça de exposições da Ilha Açores” at Costão do Santinho Resort at 7 pm!

The Scientific and Organizing Committees will welcome you!

Then a cocktail with hot and cold “canapés” with alcoholic and non-alcoholic beverages!



SOCIAL EVENTS

ISNH PARTY

On Monday 5th, after the daily sessions, we invite you to enjoy a party at the Mr. Hoppy Ingleses, located near Costão do Santinho Resort and in front of the beach (R. das Gaivotas, 863 - Ingleses Norte, Florianópolis – SC)

The place has a varied menu of beers, drinks, hamburgers and typical snacks, including vegetarian options.

The ticket to the party will entitle you to 3 house draft beers. The evening will be animated by two shows, playing Brazilian music and international rock

Tickets can be purchased from the ISNH staff.



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SOCIAL EVENTS

SYMPOSIUM BANQUET

On Wednesday 7th the Symposium banquet will be held at the *Restaurante Vitória* inside the Costão do Santinho Resort, with great food and beer and a nice view to the beach. Join us at a pleasant night.

The ticket for attendees staying at the Costão do Santinho Resort is 20 USD, and for attendees staying in other accommodations is 40 USD.

Attendees can sign up for the ISNH banquet at the registration desk.



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TOURIST TOURS

These tours are not included in the Symposium registration fee.
They can be purchased separately.

Schooner Canasvieiras – "Barco Pirata Full"

Visit the best places in Florianópolis. You can see the best view of the most beautiful beaches from an enjoyable schooner with funny pirate characters.

Itinerary for this tour:

Transfer leaving at "Costão do Santinho" hall at 9:30 AM

Schooner departure: 10:30 AM

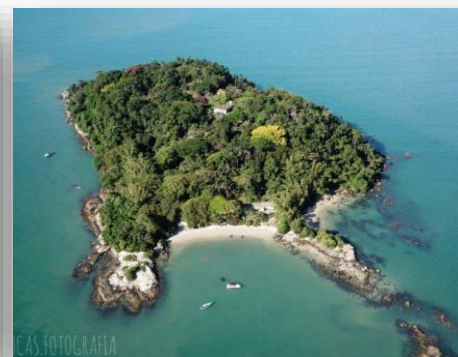
Departure from the Canasvieiras warehouse, located to the north of Santa Catarina Island, in the city of Florianópolis.

- Panoramic view of "Ilha do Francês" and the beaches of "Jurerê Tradicional, Internacional, Daniela and Forte beach".
- Panoramic view of "São José da Ponta Grossa Fort", with a brief explanation of its history.
- Panoramic view of the "Santa Cruz de Anhatomirim Fortress", with explanation of the historical part.
- Passage through the bay of the dolphins 🐬🐬 (If we are lucky, they will be there, and we stop to observe them).
- Stop for lunch and swim at the coastal beach of "Costeira da Armação", located in Governador Celso Ramos.

Return to Canasvieiras.

Schooner arrival: 3 PM

Tour package Fee: \$ 60,00



Check the website for more information: <https://escunamartin.com.br>

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TOURIST TOURS

Visit "Tamar Project" and "Haras Ypê"

*If you want to get to know the nature around Florianópolis, this tour is for you.
You can enjoy horseback riding and an amazing wildlife conservation project.*

Itinerary for this tour:

Transfer leaving at "Costão do Santinho" hall at 7:15 AM

Tour: "Haras Ypê" – 8 to 10 AM

Experience an incredible horseback ride through the stunning landscapes of the Rio Vermelho Forest Park trails and the Moçambique beach, lasting approximately two (02) hours, using Mangalarga Marchador breed animals, all docile and trained.

Tour: "Tamar" Project – 11 to 12:30 PM

TAMAR Project Foundation works in the environmental awareness and education of visitors, communities and fishermen. It is one of the most important wildlife conservation foundations in Brazil.

The Florianópolis Visitor Center has an infrastructure that includes five observation tanks with four out of five species of sea turtles that spawn in Brazil, video room and exhibitions, children's area, and store for the sale of TAMAR products.

The visitation center will wait for you to explain more about the Brazilian turtle wildlife.
After the tour, you are free to have Lunch.



Tour package Fee: \$ 60,00

Check the websites for more information:

<https://harasype.com.br>

<https://www.tamar.org.br>

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ORGANIZING COMMITTEE

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Pablo Gregorini (chair)
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Aila Orvokki Vanhatalo

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Isadora Zelone da Silva

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SPEAKERS

Opening Lecture Speaker

Wolfgang Pittroff

Keynote Speakers

Marcus Clauss

Juan Villalba

Jude Capper

Cameron Clark

Alexandre Berndt

Invited Speakers

Emilio Ungerfeld

Pablo Soca

Bryan Thompson

Dahlanuddin

Juan Villalba

Tommy Boland

Dario Colombatto &

Alejandro Relling

Anita Fleming

Jude Capper

Yingjun Zhang

Pablo Manzano

Maryline Boval

Hayley Norman

Cameron Clark

Jennifer Ellis

Antonello Cannas

Robin White

Alexandre Berndt

Stephan van Vliet

Cesar Patino &

Anthony Whitbread

Juan Tricarico

Workshop Speakers

Pilar Sepulveda Varas

Ruan Rolnei Daros

João Cardoso Costa

Daniel Talmón

Mariana Carriquiry

Ignacio De Barbieri

Paulo C. F. Carvalho

Iain Gordon

Pablo Gregorini

Tribute Speakers

Pablo Chilbroste &

Jan Dijkstra

L. C. Pinheiro Machado Jr.

Antonello Cannas

Juan Carlos Ku-Vera

Maryline Boval &

Christelle Loncke

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REVIEWERS

Acknowledgment

Alejandra Marín Gomez

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João Pedro Donádio

Juan Villalba

Jusiane Rossetto

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Milene Puntel Osmari

Paulo César de Faccio Carvalho

Ricardo Kazama

Rubia Dominschek

Sagara Kumara

Taise Kunrath

William de Souza Filho

Zimbábwe Osório Santos

We would like to thank the Reviewers for taking the time and effort necessary to review the abstracts submitted to the ISNH 2023.



WORKSHOPS

Animal welfare: nutritional implications for herbivores

Organized by Prof. Luiz Carlos Pinheiro Machado Filho

Speakers:

Pilar Sepulveda Varas

Presenting: Blood analytes in the assessment of metabolic and nutritional disorders in transition dairy cows: how can it improve their welfare?

Ruan Rolnei Daros

Presenting: Increased pasture biodiversity and its relation to ruminants' welfare.

João Cardoso Costa

Presenting: Feeding the individual, not the group: utilizing behavioral and nutritional data to improve the welfare of ruminants.

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WORKSHOPS

Contribution of energy efficiency determinations on the design of profitable and environmentally sustainable ruminant production systems

Organized by Prof. Pablo Chilibroste

Speakers:

Dr. Daniel Talmón, Universidad de la República

Presenting: Feeding strategy and Holstein strain affect the energy efficiency of lactating dairy cows.

Professor Mariana Carriquiry, Universidad de la República

Presenting: Energy efficiency of beef cattle in grazing production systems: I. Effect of selection for residual feed intake & II. Effect of herbage allowance on cow-calf systems.

Dr. Ignacio De Barbieri, National Institute of Agricultural Research of Uruguay - INIA

Presenting: Breeding for improved feed efficiency and decreased methane emissions in sheep.

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WORKSHOPS

Grazing ecology: from science to practice

Organized by Prof. Paulo de Faccio Carvalho

Speakers:

Professor Iain Gordon, Australian National University & Lincoln University

Presenting: Herding the literature: trends in large mammalian herbivore grazing and foraging ecology research over the past three decades.

Professor Pablo Gregorini, Lincoln University

Presenting: Lincoln University Integral Health Dairy Farm: a dairy farm designed for nutritional and environmental health.

Professor Paulo de Faccio Carvalho, Federal University of Rio Grande do Sul

Presenting: From bite to farm: grazing ecology in practice.

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SATELLITE CONFERENCES

Sponsors presentation

Professor Dr. Paulo de Faccio Carvalho
Federal University of Rio Grande do Sul

Director of the Aliança SIPA / ICLS Alliance

Representing: Aliança SIPA

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SATELLITE CONFERENCES

Sponsors presentation

Dr. Juan Tricarico
Dairy Management Inc

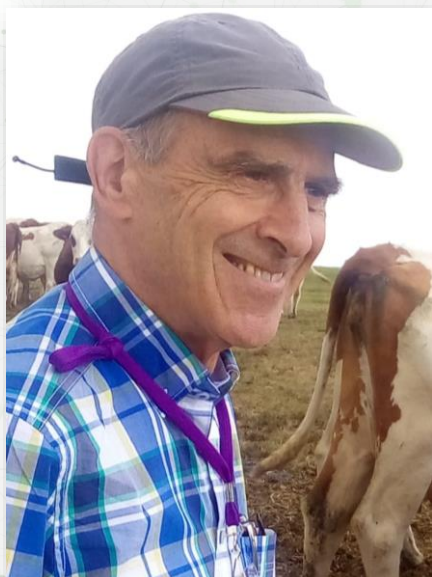
Senior Vice President – Environmental Research
Representing: Innovation Center for U.S. Dairy

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TRIBUTES ISNH 2023

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“He was a precursor in the field of animal nutrition modelling”



Daniel Sauvant

(1946– 2022)

Our colleague and friend Daniel Sauvant left us on 19 May 2022. Daniel was a lecturer and researcher in the field of nutrition and animal feeding (from 1970 to 2011) at AgroParisTech, and then emeritus Professor at the same institution. He had many functions throughout his career, such as Director of the INRA Laboratory, which became UMR MoSAR (1985–2010); Chairman of the Department of Animal Sciences at AgroParisTech (1995–2006); Chairman of the French Association of Animal Science (2000–2014); member of several expert committees and member of the French Academy of Agriculture since 1995 and of the French Veterinary Academy since 2015.

Daniel Sauvant was an extremely brilliant lecturer who always displayed a passion for pedagogy and transmission of knowledge and skills. Gifted with a powerful synthetic mind, his teaching combined a solid body of biological facts, a rigorous approach to quantification and modelling, and practical sessions on feeding livestock and herd management. He left his mark on a great number of generations of students and gave rise to many vocations. He also invested a lot of time and energy in further education for professionals, where his bespoke talks combined with his friendly, humble and generous personality were much appreciated.

Daniel's research work has had a profound impact on the field of animal nutrition. However difficult it might be to single out a specific result within such a prolific and coherent body of work, we would like to highlight two of his major contributions: he played a leading role in the elaboration of animal feed unit systems, particularly for ruminants from their first edition in 1978 to their last in 2018; he was also a precursor in the field of animal nutrition modelling and, in a resolutely visionary manner, he was able to give his research unit a "modelling" orientation that is now widely recognized.

Maryline Boual

French National Institute for Agricultural Research

Maryline Boual

UMR AgroParisTech INRAE MoSAR



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“He developed innovative nutritional techniques which helped to advance scientific knowledge”



Egil Robert Ørskov

(1934 – 2021)

Professor Egil Robert Ørskov was born in 1934 in Jutland, Denmark and passed away in 2021 in Aberdeen, Scotland. From early childhood, Bob Ørskov helped his family in the dairy farm. In 1958 he went to Copenhagen and entered the Royal Veterinary and Agricultural University. For his PhD at the University of Reading, England, Bob Ørskov worked on the energetic efficiency of volatile fatty acids (VFA) in sheep. He was hired in 1967 by Kenneth Blaxter to work at the Rowett Research Institute in Scotland, where he spent most of his productive scientific career. Bob Ørskov displayed considerable skills to develop innovative nutritional techniques which helped to advance

scientific knowledge. He took on the nylon bag technique and applied mathematical principles that helped to better describe the kinetics of rumen fermentation of feedstuffs. Bob Ørskov developed the intragastric infusion technique, which was highly precise for accurately controlling energy and nitrogen supply to ruminants. With the intragastric infusion technique, he found that there were no differences in the efficiency of utilization of VFA for energy retention in the body of sheep, implying that the heat increment of feeding was due to a larger extent to physical activity rather than to the metabolism of VFA. He also developed the purine derivative technique, a useful technique to better understand nitrogen metabolism in ruminants. He travelled many countries on behalf of organizations such as the Overseas Development Administration, Danish International Development Agency and the Food and Agricultural Organization of the United Nations. In developing countries, he advised governments, consultants, scientists and farmers, on the most efficient approaches for the feeding of ruminants. Professor Ørskov will be missed by the scientific community in animal science, but his outstanding legacy in the field of energy and nitrogen metabolism of ruminants will endure the passing of time.

Juan Carlos Ku-Vera

University of Yucatan



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“Always ahead of his time.”



LUIZ CARLOS PINHEIRO MACHADO

(1928 - 2020)

He was born in Porto Alegre, Brazil, graduated in Agronomy at UFRGS (Federal University of R. Grande do Sul) in 1950. He was later a professor in Zootechny at the same University, where he obtained his doctorate in 1959. In 1962 he became the youngest full professor in Brazil. In 1964 he was purged from UFRGS by the military dictatorship. Prohibited from teaching at any university in the country, he continued to teach elsewhere. During this period he was a professor at the Catholic University of Argentina (1974/78) and the University of Buenos Aires (1974/1980). With the amnesty (1979) he returned to UFRGS, and in 1981 became a professor in Agronomy at UFSC (Federal University of Santa Catarina), where he founded the first discipline of Applied Ethology in Latin America. He actively participated in the country's redemocratization process, and in the movements for an ecologically-based agriculture, giving great impetus to Agroecology. He received numerous honors for his professional work, from students and from professional associations, being

honorary member of associations in Brazil and abroad. Professor and researcher, he dedicated his life to teaching, research and extension. His main contributions were the introduction of the bacon type pig in South America, through intense activity in pig farming in the 60s and the book “The Pigs”, written in 1967 and published in Portuguese and Spanish. The dissemination, teaching, research and innovation of André Voisin's work. He founded the André Voisin Institute (1970) and coined the expression “Pastoreio Racional Voisin” (PRV, Voisin Rational Grazing - VRG). Conducted hundreds of training courses and projects in PRV. Implemented three innovations of great importance: the concept of dividing the area with square plots and perimeter corridors, the presence of water trough in the plots, taking water to the animal and not the animal to the water, and the design of a corral respecting the animal and human behavior and well-being, applying the principles developed by Temple Grandin. In 2004 he published the book “Voisin Rational Grazing”, in Portuguese and Spanish, which renewed interest in the subject, now from an agroecological perspective, and where he systematized his innovations. He carried out numerous international cooperation works, disseminating the PRV technique in more than 15 countries. In the last years of his life, he dedicated himself to promoting Agroecology in animal husbandry, which resulted in the book “The Dialectic of Agroecology”, published in 2010 in Portuguese and Spanish. He was, first and foremost, a professor. Patient, didactic, tireless in explanations. There were more than 65 years of activity as a teacher - active, expurgated or retired - in which he taught thousands of classes, and for each one he got up early to prepare or revise.

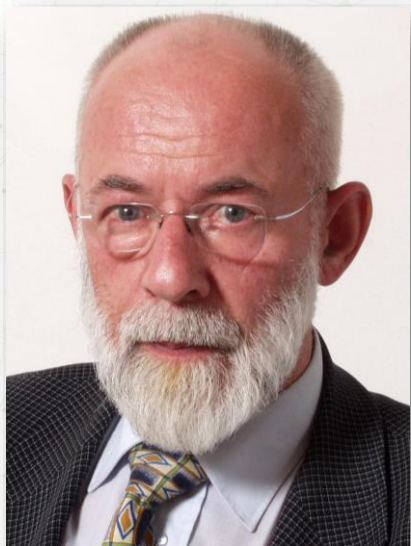
L.C. Pinheiro Machado Filho
Federal University of Santa Catarina



TRIBUTES ISNH 2023

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“Renowned worldwide as a passionate, dedicated researcher in ruminant nutrition”



Seerp Tamminga

(1942 – 2022)

He was a renowned worldwide as a passionate, dedicated researcher in ruminant nutrition. Seerp studied at the former Agricultural College in Wageningen (now Wageningen University) and graduated in 1970, to start his scientific career at the Institute for Animal Nutrition Research (IVVO) in Hoorn (the Netherlands) (relocated in 1976 to Lelystad). Focusing largely on rumen function, Seerp was convinced of the added value of ruminants in the food chain: converting human inedible resources into highly valued ruminant products. He was the founding father of the Dutch protein evaluation system for ruminants, the “DVE” system, which was rapidly adopted by Dutch farmers in 1991. It became a solid basis for many scientific avenues and an excellent

connection between science and practice.

Nitrogen metabolism in ruminants was also the topic of his PhD thesis (1981: Wageningen, the Netherlands). During the research period at IVVO, from 1975 to 1976 Seerp also worked at the University of Newcastle upon Tyne (UK). From 1985 until 2005, Seerp became the chair of the Animal Nutrition Group of Wageningen University. He shared this chair with Professor Martin Verstegen. The international, scientific impact of Seerp is demonstrated by the supervision of over 40 PhD students from all over the world and over 180 articles in peer-reviewed journals.

Seerp did not need many words. Once contact was established, his knowledge, sharp judgement, loyalty and vision were highly appreciated by colleagues and students. His opinions were clear and well underpinned. Seerp increasingly appreciated the multicultural aspects of education at Wageningen University, and established valuable contacts in many countries, particularly in Uruguay. Students and peers will remember Seerp as a thoughtful, inspiring mentor and scholar. There was a lot to be learned from Seerp, and we are lucky we had this opportunity.

Jan Dijkstra

Wageningen University

Pablo Chilibroste

Universidad de la República de Uruguay

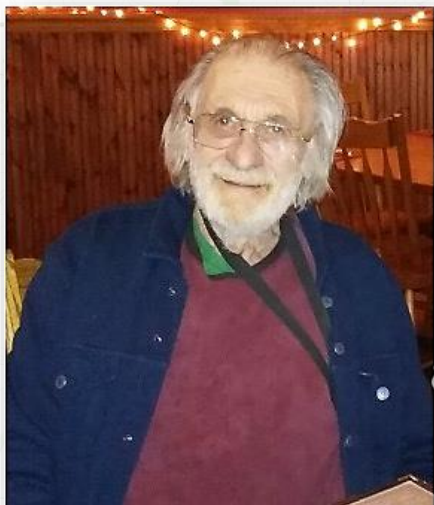


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"The person who changed the nutrition of herbivores"



Peter J. Vans Soest

(1929 – 2021)

Prof. Peter J. Van Soest, one of the greatest scientists ever in animal nutrition, left us on March 21, 2021.

He earned his bachelor's and master's degrees in Dairy Husbandry from Washington State University and his doctorate from the University of Wisconsin in 1955. In 1957, he began working at the USDA-Agriculture Research Service, Beltsville, MD, with the mission to replace the crude fiber (CF) method. In 1968, he joined the Department of Animal Science at Cornell University, Ithaca, NY, where he showed a great passion for teaching, mentoring and inspiring, even well after his retirement, hundreds of undergraduate and graduate students.

His efforts in replacing CF initially focused on measuring lignin, the indigestible component of fiber, developing the methods for lignin and ADF analysis and

then, later, the one for NDF (neutral detergent fiber), which estimated fiber much more accurately than the CF method. He understood that fiber was the component of plant foods that most limited the digestibility of feeds and their intake. He developed in vitro methods for estimating the digestibility of NDF and demonstrated that lignin was the major fiber component that defined indigestible NDF fiber. His research, intellect, and tremendous competence in the areas of herbivore nutrition, agronomy, ecology, and zoology are condensed in his book "Nutritional Ecology of the Ruminant", considered a fundamental reference in all these fields. Prof. Van Soest also greatly contributed to the development of modern nutritional models for ruminants.

His students and colleagues scattered all over the world and all those who had the chance to meet him, even occasionally, listening to a lecture at a conference or a chat with producers (whom he loved and by whom he was loved), have a very fond memory of him, clearly visible in the great emotion and sense of gratitude that his death has aroused all over the world.

Antonello Cannas

*Department of Agricultural Science,
University of Sassari*

Stefania Carpino

*Ministry of Agriculture, Food Sovereignty
and Forests*

David R. Mertens

Mertens Innovation & Research LLC



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ORAL PRESENTATIONS

Check the schedule for oral presentations here:

[Schedule for Oral Presentations](#)

Look for your submission ID according to the Oxford Abstract Platform to identify the day and time of your oral presentation.

Oral presenters will have 18 minutes (12-15 min talk + 3 min Q&A). We count on presenters to stay on time.

Each presentation room will have a notebook connected to a projector, laser pointer, and microphone.

We suggest you send your presentation file by email isnh2023@gmail.com until June 2, 2023. However, you may bring your presentation file (stored on a flash drive) to the ISNH-2023 staff during breaks before your presentation. Our staff will assist you in loading your file on the conference computer.

We recommend that you prepare your presentation using the Microsoft PowerPoint software but also save and bring along a PDF version of your presentation. If you prefer to use another software to create your slideshow presentation, you must bring the PDF file.

The slides for your oral presentation should be in a 16:9 aspect ratio (widescreen).

For a 12 to 15-minute of presentation, you can prepare around 10-15 slides (maximum 20), including a slide for the abstract title, authors, and affiliations; the introduction (brief contextualization of the study); the objective(s); material and methods; results and brief discussion; and conclusions and/or implications. In addition, you may include references and acknowledgments.



POSTER DISPLAY

All posters will be displayed at the exhibit hall from June 5 to 6, 2023. Presentations will be held in a single session on June 6 from 14:30 to 16:00.

The exhibit hall will open on June 5 early morning. We ask attendees to set up the posters on the display boards on June 5 from 08:00 to 14:00.

Each abstract accepted for poster presentation was assigned a code (letter P + number). That numbering code was used for the Symposium's proceedings and will identify each display board. Please look for the poster code to locate your poster display board.

You can consult the code referring to your abstract here: [Poster Presentation – Program Code](#)

The ISNH-2023 staff in the poster area may assist authors in putting up or taking down their posters. A poster hanger (push pins, tape, or rope) will be provided.

Presenters are asked to take down the posters on June 6 evening from 18:00 to 20:30. After that, the remaining posters will be removed by the ISNH-2023 staff.



ISNH 2023

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ISNH 2023, 04 - 08 June, Florianópolis Brazil



INTERNATIONAL SYMPOSIUM ON THE NUTRITION OF HERBIVORES

June 4-8, 2023 • Florianópolis, Brazil



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PROGRAM OUTLINE												
Sunday 04 June		Monday 05 June			Tuesday 06 June			Wednesday 07 June		Thursday 08 June		
07:00 08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00	<div><div>Room 1</div><div>Room 2</div><div>Room 3</div><div>Coffee break</div><div>Lunch</div><div>Social events/Tours</div></div>							Tour - Option 2 Transfer departure at 07:00 Tour “Haras Ypê” (08:00 - 10:00)				
		Registration (08:00 - 09:00)										
		Opening Session 1 (09:00 - 10:00)			Opening Session 3 (09:00 - 10:00)			Tour - Option 1 Transfer departure at 09:00 Schooner departure at 10:30 Schooner arrival at 15:00 Return to event venue Arrival ~ 16:20		Opening Session (09:00 - 10:00)		
		Coffee Break & free poster viewing (10:00 - 10:30)			Coffee Break & free poster viewing (10:00 - 10:30)					Coffee Break (10:00 - 10:30)		
		Plenary Session 1 (10:30 - 11:00)	Plenary Session 1 (10:30 - 11:00)	Plenary Session 1 (10:30 - 11:00)	Plenary Session 3 (10:30 - 11:00)	Plenary Session 3 (10:30 - 11:00)	Plenary Session 3 (10:30 - 11:00)			Plenary Session 4 (10:30 - 11:00)	Plenary Session 4 (10:30 - 11:00)	Plenary Session 4 (10:30 - 11:00)
		Oral Presentations Theme 1 (11:00 - 12:40)	Oral Presentations Theme 1 (11:00 - 12:40)	Oral Presentations Theme 1 (11:00 - 12:40)	Oral Presentations Theme 3 (11:00 - 12:00)	Oral Presentations Theme 3 (11:00 - 12:00)	Oral Presentations Theme 3 (11:00 - 12:00)	Tour “Tamar” Project (11:00 - 12:30)		Oral Presentations Theme 4 (11:00 - 12:20)	Oral Presentations Theme 4 (11:00 - 12:20)	Oral Presentations Theme 4 (11:00 - 12:20)
		Lunch & free poster viewing			Lunch & free poster viewing					Lunch		
										Opening Session 5 (14:30 - 15:30)		
								Coffee Break (15:30 - 16:00)				
Plenary Session 2 (16:00 - 16:30)			Plenary Session 2 (16:00 - 16:30)	Plenary Session 2 (16:00 - 16:30)	Coffee Break & free poster viewing (16:00 - 16:30)					Plenary Session 5 (16:00 - 16:30)	Plenary Session 5 (16:00 - 16:30)	Plenary Session 5 (16:00 - 16:30)
Oral Presentations Theme 2 (16:30 - 18:00)			Oral Presentations Theme 2 (16:30 - 18:00)	Oral Presentations Theme 2 (16:30 - 18:00)	Workshop 1 (16:30 - 19:00)	Workshop 2 (16:30 - 19:00)	Workshop 3 (16:30 - 19:00)			Oral Presentations Theme 5 (16:30 - 17:30)	Oral Presentations Theme 5 (16:30 - 17:30)	Oral Presentations Theme 5 (16:30 - 17:30)
											Short break (15 min) - all attendees return to Room 1	
Opening Cerimony (18:00 - 18:30)											Tributes (17:45 - 19:00)	
Opening Lecture (18:30 - 19:30)												
Folkloric presentation (19:30 - 20:00)			ISNH Party (19:00 - 23:00)			Short break (15 min) - all attendees return to Room 1					Closing session (19:00 - 20:00)	
Welcome Reception (20:00 - 22:00)						Sponsors presentation (19:15 - 19:45)						
									Symposium Banquet (20:00 - 23:00)			

SUNDAY 04 JUNE 2023

INSH Opening Night		Code
13:00 - 18:00	Registration	
18:00 - 18:30	Opening Ceremony	
18:30 - 19:30	Opening Lecture	
	Professor Wolfgang Pittroff, Samarkand State University	
	Presenting: Keystone Issues in Ruminant Science	O1
19:30 - 20:00	Folk Group Performance	
20:00 - 22:00	Welcome reception	

MONDAY 05 JUNE 2023

08:00 - 19:00	Registration	
SESSION 1: Ecological Nutrition of Herbivores		
Opening Session - Keynote Talk		
09:00 - 10:00	Professor Marcus Clauss, University of Zurich	
	Presenting: Evolutionary trajectories in mammalian herbivory: washing, chewing, microbe farming (online)	
10:00 - 10:30	Coffee break & free poster viewing	
Plenary session in parallel - Room 1		
Reconciling productivity, needs and demands with nutritional ecology		
10:30 - 11:00	Dr. Emilio Ungerfeld, Instituto de Investigaciones Agropecuarias - INIA	
	Presenting: Biological consequences of the inhibition of rumen methanogenesis (online)	
11:00 - 11:30	Professor Dahlanuddin, University of Mataram	O3
	Presenting: Leucaena based cattle feeding systems for improved nutrition, livelihoods, and landscapes in eastern Indonesia (online)	
Oral presentations in parallel - Room 1		
Session 1 – Ecological Nutrition of Herbivores		
11:30 - 11:50	F. Dupuy	O5
	Understanding spatial-temporal grazing management: evolution of state variables and productive results at cow-calf grassland system	
11:50 - 12:10	T. Van den Bossche	O7
	Effect of supplementing α -amylase enzymes or essential oil components on the performance, nitrogen balance and enteric emissions of dairy cows	
12:10 - 12:30	M.E. Cerón-Cucchi	O11
	Botanical composition and nutritional chemistry of the diet of llamas from Andean altiplan grazing native grassland	
Plenary session in parallel - Room 2		
Reconciling productivity, needs and demands with nutritional ecology		
10:30 - 11:00	Professor Pablo Soca, Universidad de la República de Uruguay	
	Presenting: Integrate knowledge on animal physiology and grassland ecology in the system redesign process to promote grassland ecological intensification (GEI)	
Oral presentations in parallel - Room 2		
Session 1 – Ecological Nutrition of Herbivores		
11:00 - 11:20	B.V. Freitas	O4
	Supplementing ruminants with low-dose of organic trace-minerals reduces mineral excretion without compromising the physiological mineral status	
11:20 - 11:40	J.L. Zegarra Paredes	O8

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11:40 - 12:00	Ruminal degradability "in situ" of the larvae and pupae black soldier fly meal (<i>Hermetia illucens</i>) in dairy cattle T.C. Baldissera	O15
12:00 - 12:20	Can pasture pre-grazing heights targets be similar under full sun and shaded conditions? animal response S. Acuña Ballesteros	O17
12:20 - 12:40	Effect of shade and water on competition for food resources A. Asher	O18
	"The dark side of the light": the effect of led illumination on feed efficiency, production and welfare of livestock	
Plenary session in parallel - Room 3 Reconciling productivity, needs and demands with nutritonal ecology		
10:30 - 11:00	Dr. Bryan Thompson, AgResearch Presenting: Matching grazing behaviour to landscape - a foraging syndrome framework for livestock	O62
Oral presentations in parallel - Room 3 Session 1 – Ecological Nutrition of Herbivores		
11:00 - 11:20	S. Lashkari Milk fatty acid composition of cows fed forb-rich silage: results from three Danish organic farms	O6
11:20 - 11:40	L.S. Takahashi <i>Tithonia diversifolia</i> as unconventional roughage source for ruminant diets reduces in vitro gas production	O10
11:40 - 12:00	J. Van Mullem In vitro evaluation of the methane reducing potential of extruded linseed in relation to roughage composition of dairy cattle diets	O12
12:00 - 12:20	F. Casalás Structural characteristics of natural grasslands communities define the defoliation pattern by cattle	O13
12:00 - 12:20	M.B. Henson Use of plant growth-promoting rhizobacteria in forage systems	O14
12:40 - 14:30	Lunch & free poster viewing	
SESSION 2 - Optimal Nourishing of Herbivores Opening Session - Keynote Talk		
14:30 - 15:30	Professor Juan Villalba, Utah State University Presenting: Herbivory and the power on nourishing for health	O19
15:30 - 16:00	Coffee break & free poster viewing	
Plenary session in parallel - Room 1 Dietary taxonomical and biochemical diversity... optimal nourishment?		
16:00 - 16:30	Dr. Anita Fleming, Lincoln University Presenting: A vade-mecum for grazing and health (online)	O39
Oral presentations in parallel - Room 1 Session 2 – Optimal Nourishing of Herbivores		
16:30 - 16:50	A. Vanhatalo The effects of grain legume and rapeseed meal supplementation on amino acid metabolism of dairy cows fed grass silage-based diets	O21
16:50 - 17:10	S. Giger-Reverdin	O26

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17:10 - 17:30	Is feed efficiency estimated by different metrics a trait characterizing variability between dairy goats? R.A.M. Vieira	O25
17:30 - 17:50	Particle sizes in feces of lactating ewes fed on diets made of fine, medium, and coarse hay S. Giger-Reverdin	O30
	Does the new INRAtion®V5 feeding system estimate with accuracy digestibility and n outputs in lactating goats fed various diets?	
Oral presentations in parallel - Room 2		
Session 2 – Optimal Nourishing of Herbivores		
16:00 - 16:20	C. Gomez	O22
	Study of the potential use of bamboo forage in cattle feed	
16:20 – 16:40	C. Moreira	O29
	Effect of replacing TMR with mid-vegetative or early bud lucerne in rumen fermentation using the rumen simulation technique (RUSITEC)	
Plenary session in parallel - Room 2		
Dietary taxonomical and biochemical diversity... optimal nourishment?		
16:40 – 17:10	Professor Tommy Boland, University College Dublin	
	Presenting: The role of dietary diversity in delivering multiple dividends in pasture-based livestock production (online)	
Oral presentations in parallel - Room 2		
Session 2 – Optimal Nourishing of Herbivores		
17:10 - 17:30	A. Cannas	O31
	Causes of milk fat depression of lactating dairy ewes fed fresh annual ryegrass herbage	
17:30 - 17:50	S. Lashkari	O33
	High fat level is required to protect and deliver the natural form of vitamin e in calves post-weaning	
Plenary session in parallel - Room 3		
Dietary taxonomical and biochemical diversity... optimal nourishment?		
16:00 - 16:30	Professor Dario Colombatto, Universidad de Buenos Aires & Professor Alejandro Relling, The Ohio State University	
	Presenting: Intersection between perfect nutrition and practical application in beef cattle nutrition	
Oral presentations in parallel - Room 3		
Session 2 – Optimal Nourishing of Herbivores		
16:30 - 16:50	L. Gonzalez	O27
	Supplementation of forage-based diets using molasses lick blocks to reduce greenhouse gas emissions and improve production of growing cattle	
16:50 - 17:10	S. Acuña Ballesteros	O28
	Supplementation in Creole breed of cattle can increase protein intake and improve digestibility	
17:10 - 17:30	A. Capelesso	O32
	Effect of feeding strategy and cow genotype on feed efficiency in pasture-based feeding systems	
17:30 - 17:50	H. Gonda	O34
	Providing fresh pasture in the evening for fulltime grazing dairy cows increased energy corrected milk yield	
19:00 - 23:00	ISNH Party	

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TUESDAY 06 JUNE 2023

SESSION 3 - Linking herbivores to Ecosystem Services

Opening Session - Keynote Talk

09:00 - 10:00 Professor Jude Capper, Harper Adams University
Presenting: Herbivore nutrition, ecosystems and nature-based solutions - what are the sustainability opportunities and trade-offs? O36

10:00 - 10:30 Coffee break & free poster viewing

Plenary session in parallel - Room 1

Ecosystem Services and nutrition: a. Provision; b. Regulating; c. Cultural and Supporting

10:30 - 11:00 Professor Yingjun Zhang, China Agricultural University O20
Presenting: The status of grass-based animal husbandry and the innovative grazing maximizing ecosystem multifunctionality at the improved natural grasslands.

11:00 - 11:30 Dr. Hayley Norman, CSIRO
Presenting: Domestication of shrubs to enhance livestock profitability and ecosystem services (online)

Oral presentations in parallel - Room 1

Session 3 – Ecosystem Services and Nutrition: a. Provision; b. Regulating; c. Cultural and Supporting

11:30 - 11:50 J.B. Eggers O42
Enhancing nourishment of land and livestock in agricultural landscapes with edible woody vegetation

11:50 - 12:10 J.P. Muir O44
Untangling the condensed tannin—herbivore black box

Plenary session in parallel - Room 2

Ecosystem Services and nutrition: a. Provision; b. Regulating; c. Cultural and Supporting

10:30 - 11:00 Dr. Maryline Boval, INRA O37
Presenting: What management options to increase animal nutrition and ecosystemic services?

Oral presentations in parallel - Room 2

Session 3 – Ecosystem Services and Nutrition: a. Provision; b. Regulating; c. Cultural and Supporting

11:00 - 11:20 P. Krawczel O40
The effects of grazing versus outdoor access on the productivity of Nordic red cows

11:20 - 11:40 E. Wilson O45
Relationship between plasma and saliva urea nitrogen in New Zealand red deer calves (*Cervus elaphus*)

11:40 - 12:00 C. Rivoir O48
Adaptation to grazing of primiparous Holstein dairy cows according to feeding strategy in the first 21 days postpartum

Plenary session in parallel - Room 3

Ecosystem Services and nutrition: a. Provision; b. Regulating; c. Cultural and Supporting

10:30 - 11:00 Dr. Pablo Manzano, Helsinki University & Ikerbasque Foundation of Science
Presenting: Earth needs much herbivory, but the right way: implications for livestock management.

Oral presentations in parallel - Room 3

Session 3 – Ecosystem Services and Nutrition: a. Provision; b. Regulating; c. Cultural and Supporting

11:00 - 11:20 K. Creutzinger O49
Taste aversion as a motivation test to assess hunger in dairy calves

11:20 - 11:40 A. Shirley

11:40 - 12:00	<p>An exploratory analysis of rumen temperature for 3 dairy herds in Australia: A potential path for GHG emission reduction?</p> <p>A. Mouhous</p> <p>Effect of pasture-based feeding systems on milk production and composition of dairy goats in different mountainous areas of Kabylia</p>	O53
12:40 - 14:30	Lunch & free poster viewing	
14:30 - 16:00	Poster presentations	
16:00 - 16:30	Coffee break & free poster viewing	
Parallel Workshops - Room 1		
16:30 - 19:00	<p>Grazing ecology: from science to practice</p> <p>Organized by Prof. Paulo de Faccio Carvalho</p> <p>Speakers:</p> <p>Professor Iain Gordon, Australian National University & Lincoln University</p> <p>Presenting: Herding the literature: trends in large mammalian herbivore grazing and foraging ecology research over the past three decades (online)</p> <p>Professor Pablo Gregorini, Lincoln University</p> <p>Presenting: Lincoln University Integral Health Dairy Farm: a dairy farm designed for nutritional and environmental health</p> <p>Professor Paulo de Faccio Carvalho, Federal University of Rio Grande do Sul</p> <p>Presenting: From bite to farm: grazing ecology in practice</p>	<p>O60</p> <p>O61</p>
Parallel Workshops - Room 2		
	<p>Presenting: Feeding the individual, not the group: utilizing behavioral and nutritional data to improve the welfare of ruminants</p> <p>Contribution of energy efficiency determinations on the design of profitable and environmentally sustainable ruminant production systems</p> <p>Organized by Prof. Pablo Chilbroste</p> <p>Speakers:</p> <p>Dr. Daniel Talmón, Universidad de la República</p> <p>Presenting: Feeding strategy and Holstein strain affect the energy efficiency of lactating dairy cows.</p> <p>Professor Mariana Carriquiry, Universidad de la República</p> <p>Presenting: Energy efficiency of beef cattle in grazing production systems: I. Effect of selection for residual feed intake & II. Effect of herbage allowance on cow-calf systems</p> <p>Dr. Ignacio De Barbieri, National Institute of Agricultural Research of Uruguay - INIA</p> <p>Presenting: Breeding for improved feed efficiency and decreased methane emissions in sheep</p>	<p>O56</p> <p>O57, O58</p> <p>O59</p>
Parallel Workshops - Room 3		
	<p>Animal welfare: nutritional implications for herbivores</p> <p>Organized by Prof. Luiz Carlos Pinheiro Machado Filho</p> <p>Speakers:</p> <p>Ruan Rolnei Daros</p> <p>Presenting: Increased pasture biodiversity and its relation to ruminants' welfare.</p> <p>João Cardoso Costa</p> <p>Presenting: Feeding the individual, not the group: utilizing behavioral and nutritional data to improve the welfare of ruminants.</p> <p>Maria José Hotzel</p>	O54
19:00 - 19:15	Short break (15 min) - all attendees return to Room 1	

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Satellite Event - Sponsors presentation

19:15 - 19:30	Dr. Juan Tricarico, Senior Vice President – Environmental Research Dairy Management Inc Representing: Innovation Center for U.S. Dairy
19:30 - 19:45	Professor Paulo de Faccio Carvalho, Federal University of Rio Grande do Sul, Director of the Aliança SIPA / ICLS Alliance Representing: Aliança SIPA

WEDNESDAY 07 JUNE 2023

Local tours

07:00 - 12:30	Option 1: Schooner Canasvieiras – “Barco Pirata Full”
09:00 - 15:00	Option 2: Visiting “Tamar Project” and “Haras Ypê”
20:00 - 23:00	Symposium Banquet

THURSDAY 08 JUNE 2023

SESSION 4 - Applied nutrition and herbivory in the age of big data and technology

Opening Session - Keynote Talk

09:00 - 10:00	Professor Cameron Clark, University of Sydney Presenting: Capturing and understanding animal production diversity across extensive environments to optimise the nutrition of herbivores.	O68
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10:00 - 10:30 Coffee break

Plenary session in parallel - Room 1

Applied Nutrition and modelling: We can measure a lot, but... How can we use it? Are we using it? Can we model it?

10:30 - 11:00	Professor Jennifer Ellis, University of Guelph Presenting: Drowning in data, thirsting for knowledge.	O63
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Oral presentations in parallel - Room 1

Session 4 - Applied nutrition and herbivory in the age of big data and technology

11:00 - 11:20	E. H. Cabezas-Garcia The development of silage intake models for growing cattle	O64
11:20 - 11:40	C. Battheu-Noirfalise Decision support tools for grass-based fodder management on dairy farms: current adoption and perspectives	O72
11:40 - 12:00	E.H. Cabezas-Garcia Variation in predicted enteric methane emissions of lactating cows fed typical diets across the United States	O66
12:00 - 12:20	E. H. Cabezas-Garcia Variation in predicted enteric methane emissions of dry cows fed typical diets across the United States	O70

Plenary session in parallel - Room 2

Applied Nutrition and modelling: We can measure a lot, but... How can we use it? Are we using it? Can we model it?

10:30 - 11:00	Professor Antonello Cannas, Università di Sassari Presenting: Improving sheep and goat applied nutritional models in the age of big data and technology: what can we currently do?
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Oral presentations in parallel - Room 2

Session 4 - Applied nutrition and herbivory in the age of big data and technology

11:00 - 11:20	C. Villot	O67
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11:20 - 11:40	A score including indicators of reticulo-rumen (RR) pH kinetics to characterize subacute ruminal acidosis (SARA) in dairy cows. F. Godoy-Santos	O69
11:40 - 12:00	Effects of microalgae supplementation in meat lipid composition and ruminal microbiome on finishing lambs F. Zamuner	O76
12:00 - 12:20	Potential benefits of preventive antibiotic therapy in cases of inefficient colostrum management in dairy goat kids V. Berthelot	O74
	Diet-induced changes in rumen epimural microbiota structure and predicted metabolic pathways in dairy goats	
Plenary session in parallel - Room 3		
Applied Nutrition and modelling: We can measure a lot, but... How can we use it? Are we using it? Can we model it?		
10:30 - 11:00	Dr. Robin White, Virginia Tech Data for Decisions: Objectives and approaches for data analytics to improve and inform herbivore nutrition	
11:00 - 11:30	Dr. Cesar Patino, International Livestock Research Institute Presenting: The central role of livestock in smallholder production systems in Africa and Asia: resilience, nutrition, income and sustainability. * Theme: What is the role of the herbivore in Future food systems - What to harvest? What to eat, what to feed?	
Oral presentations in parallel - Room 3		
Session 4 - Applied nutrition and herbivory in the age of big data and technology		
11:30 - 11:50	J. H. C. Costa Can we estimate calf starter dry matter intake with feeding behavior patterns?	O65
11:50 - 12:10	L. Betancor Voluntary milking systems: an option to capture higher individual milk yields on pasture-based dairy farms	O71
12:10 - 12:30	X. Barriga Productive indexes of the herbivore <i>Cavia porcellus</i> fed with <i>Hermetia illucens</i> larvae meal	O86
12:40 - 14:30	Lunch	
SESSION 5 - What is the role of the herbivore in Future food systems		
Opening Session - Keynote Talk		
14:30 - 15:30	Dr. Alexandre Berndt, EMBRAPA Presenting: What is the role of the herbivore in future food systems	O79
15:30 - 16:00	Coffee break	
Plenary session in parallel - Room 1		
What to harvest? What to eat, what to feed?		
16:00 - 16:30	Dr. Fábio Montossi, Instituto de Investigaciones Agropecuarias - INIA Presenting: Livestock ruminant production systems and value chains contributing towards a more sustainable world: opportunities and challenges (online)	O81
Oral presentations in parallel - Room 1		
Session 5 - The role of the herbivore in future food systems		
16:30 - 16:50	C. Battheu-Noirfalise The direct (meat) and indirect (organic fertilizers) contribution of beef cattle farms to food security	O82
16:50 - 17:10	J.P. Thompson	O88

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	Effect of grazing cattle on willow silvopastoral systems on animal performance and methane production	
17:10 - 17:30	P.J. Ballerstedt A ruminant revolution: the key to humanity’s sustainable future	O89
Plenary session in parallel - Room 2		
What to harvest? What to eat, what to feed?		
16:00 - 16:30	Dr. Stephan van Vliet, Utah State University Presenting: You are what you eat eats: linking plant, animal, and human health in livestock systems.	O80
Oral presentations in parallel - Room 2		
Session 5 -The role of the herbivore in future food systems		
16:30 - 16:50	R.C. Castelfranchi Black-soldier-fly larvae: an eco-friendly solution for sheep, cow and laying hens manure management, besides insect protein and fertilizer production	O83
16:50 - 17:10	J.E.M. Burgess Body composition and carcass yield of purebred feedlot cattle of different biotypes	O87
17:10 - 17:30	D.A. Rojas-Meza Potential of calabash tree (crescentia cujete) as a local resource to enhance sustainable livestock farming in the dry caribbean region	O93
Plenary session in parallel - Room 3		
What to harvest? What to eat, what to feed?		
16:00 - 16:30	Dr. Juan Tricarico, Senior Vice President – Environmental Research Dairy Management Inc Presenting: What is the role of the herbivore in Future food systems? Perspectives from the dairy value chain	
Oral presentations in parallel - Room 3		
Session 5 - The role of the herbivore in future food systems		
16:30 - 16:50	K. Barnes The dietary effects of a brown seaweed and it’s extract on dairy cow performance and methane emissions	O90
16:50 - 17:10	M. Managos Amino acid production and environmental impact from dairy cows fed best practice diets	O91
17:10 - 17:30	B.E. Bizzuti Samanea tubulosa mitigates methane emissions in sheep.	O85
17:30 - 17:45	Coffee break - all attendees return to Room 1	
Tributes - Room 1		
17:45 - 18:00	To Prof. Seerp Tamminga Prof. Pablo Chilibroste and Jan Dijkstra	
18:00 - 18:15	To Prof. Luiz Carlos Pinheiro Machado Prof. Luiz Carlos Pinheiro Machado Filho	
18:15 - 18:30	To Prof. Peter Van Soest Prof. Antonello Cannas	
18:30 - 18:45	To Prof. Daniel Sauvant Dr. Maryline Boval	
18:45 - 19:00	To Prof. Egil Robert Ørskov Dr. Juan Carlos Ku-Vera	
Closing Session		

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19:00 - 20:00

Professors Pablo Gregorini and Paulo César de Faccio Carvalho
Where to now?