Interfaces between the quantification of intake and diet selection of ruminants grazing heterogeneous pastures project (IAEA –D3.10.29) and the objectives of the Global Agenda for Sustainable Livestock (GASL)

Rogerio M Mauricio
Lecture and researcher of the Federal University of Sao Joao del Rei
Co-coordinator of IAEA – D3.10.29 project
Member of GASL – Restoring value to grassland (AN2)
Chair of the Editorial Committee of GASL
Vice-Chair of the Academia and Research cluster of GASL
✓ Braquiaria monoculture
✓ High levels of N P K
Alternatives against monoculture pasture?

Silvopastoral system (SPS)

Trees, shrubs, grasses and legumes forages in the same area
What is SPS?

Efficiency of agroecological processes:

Photosynthesis & biomass production

Nitrogen fixation

Solubilization of soil phosphorus and other nutrients

The "inputs" of the system are the natural processes themselves

The Guabo Farm Edilberto Serracín, Chiriquí Panamá. Fernando Uribe CIPAV

Efficient use of water

Organic matter and soil biological activity
Sward characteristics and performance of dairy cows in organic grass–legume pastures shaded by tropical trees

D. S. C. Paciullo¹, M. F. A. Pires¹, L. J. M. Aroeira¹, M. J. F. Morenz¹, R. M. Maurício², C. A. M. Gomide¹ and S. R. Silveira²

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²Bio-Engineering Department, Federal University of São João Del Rei, Praça Frei Orlando 170, CEP 36307-352, São João Del Rei, Minas Gerais, Brazil
ILC2018 Keynote paper*

Establishment and management of leucaena in Latin America
Establecimiento y manejo de leucaena en América Latina

NAHUEL A. PACHAS¹, ALEJANDRO RADRIZZANI², ENRIQUE MURGUEITIO³, FERNANDO URIBE⁴, ÁLVARO ZAPATA CADAVID³, JULIÁN CHARÁ³, TOMÁS E. RUIZ⁴, EDUARDO ESCALANTE⁵, ROGERIO M. MAURICIO⁶ AND LUIS RAMÍREZ-AVILÉS⁷
Forage intake, feeding behavior and bio-climatological indices of pasture grass, under the influence of trees, in a silvopastoral system

L.F. SOUSA¹, R.M. MAURÍCIO², D.S.C. PACIULLO³, S.R. SILVEIRA², R.S. RIBEIRO², L.H. CALSAVARA² AND G.R. MOREIRA⁴

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⁴Departamento de Estatística e Informática, Universidade Federal Rural de Pernambuco, Recife, PE, Brazil. www.deinfo.ufrpe.br
- Braquiaria
- Panicum
- Leucaena
- Shrubs
Prosopis
Leucaena
Cynodon
Morphogenesis, biomass and nutritive value of *Panicum maximum* under different shade levels and fertilizer nitrogen rates


*Embrapa Dairy Cattle, Juiz de Fora, Minas Gerais, Brazil, †Federal University of São João Del Rei, São João Del Rei, Minas Gerais, Brazil
Amora (Morus alba)
Intake?

Quantification of intake and diet selection of ruminants grazing heterogeneous pasture using compound specific stable isotopes – IAEA D3.10.29
Objectives

- Improve prediction of intake and diet selection/composition of cattle consuming mixtures of plant species in pastures/rangelands

- Practical NIRS based prediction equations of intake and diet composition of cattle consuming multi-species pasture grasses, legumes and browses
Productivity and nutritional quality of Flechinha grass (*Echinolaena inflexa*),
native grass of Brazilian Cerrado

Produção e qualidade nutricional do capim-flechinha (*Echinolaena inflexa*),
gramínea nativa do Cerrado brasileiro

Sylvia Rocha e Silveira¹ Rafael Sandin Ribeiro¹ João Paulo Sacramento¹
Domingos Sávio Campos Paciullo² Luiz Gustavo Ribeiro Pereira²
Rogério Martins Maurício³
Tithonia diversifolia
RESEARCH ARTICLE

_Tithonia diversifolia_ as a Supplementary Feed for Dairy Cows

Rafael Sandin Ribeiro¹, Stephanie Amelia Terry², João Paulo Sacramento¹, Sylvia Rocha e Silveira¹, Cláudia Braga Pereira Bento³, Elsa Fernandes da Silva³, Hilário Cuquetto Mantovani³, Marco Antônio Sundfeld da Gama⁴, Luiz Gustavo Ribeiro Pereira⁴, Thierry Ribeiro Tomich⁴, Rogério Martins Maurício¹, Alexandre Vieira Chaves²*

1 Bioengineering Department, Universidade Federal de São João del-Rei, São João del-Rei, MG, Brazil, 2 The University of Sydney, Faculty of Veterinary Science, School of Life and Environmental Sciences, Sydney, NSW, Australia, 3 Departamento de Microbiologia, Universidade Federal de Viçosa, Viçosa, MG, Brazil, 4 Embrapa Gado de Leite, Juiz de Fora, MG, Brazil
**Different geographical locations and physiological stages**

- Argentina
- Mexico
- Brazil

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>N Spectra</th>
<th>Mean</th>
<th>Min</th>
<th>Max</th>
<th>SEC</th>
<th>R2C</th>
<th>SECV</th>
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<tr>
<td>DMa</td>
<td>g/Kg of DM</td>
<td>166</td>
<td>887.45</td>
<td>826.52</td>
<td>948.39</td>
<td>3.51</td>
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<td>Ash</td>
<td>g/Kg of DMa</td>
<td>172</td>
<td>119.06</td>
<td>33.39</td>
<td>204.73</td>
<td>8.73</td>
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<td>CP</td>
<td>g/Kg of DMa</td>
<td>170</td>
<td>183.26</td>
<td>30.66</td>
<td>335.85</td>
<td>11.24</td>
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<td>NDF</td>
<td>g/Kg of DMa</td>
<td>171</td>
<td>473.43</td>
<td>236.11</td>
<td>710.75</td>
<td>31.79</td>
<td>0.84</td>
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<td>ADF</td>
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<td>169</td>
<td>333.17</td>
<td>164.5</td>
<td>501.84</td>
<td>19.33</td>
<td>0.88</td>
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<tr>
<td>EE</td>
<td>g/Kg of DMa</td>
<td>84</td>
<td>15.33</td>
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<td>26.31</td>
<td>2.05</td>
<td>0.69</td>
<td>2.38</td>
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</table>

SECV x SEC diferença menor 5%
SEC próximo de 0
Prediction error and repeatability of near infrared reflectance spectroscopy applied to faeces samples in order to predict voluntary intake and digestibility of forages by ruminants

V. Decruyenaere, V. Planchon, P. Dardenne, D. Stilmant

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d Walloon Agricultural Research Centre (CRA-W)—Valorisation of Agricultural Products Department, 24 Chaussée de Namur, B-5030 Gembloux, Belgium
Global Agenda for Sustainable Livestock
GASL is a **multistakeholder partnership**. It enhances the contribution of livestock systems to sustainable development and is a recognized platform for sharing solutions (**109 institutional members**).
GASL Main Publications in 2017-2019
GASL adopted the four sustainability domains as an outcome of the Global Forum for Food and Agriculture (GFFA) in Berlin, January 2018. The domains guide the work of the Global Agenda and serve as a framework along with the SDGs.
The **eight multistakeholder partnership meetings** have
- built consensus;
- shared knowledge;
- developed a common vision of the contribution of the livestock sector to the SDGs.

Each meeting had a **specific theme**.

The meetings addressed both **global and regionally specific issues** in the form of policy forums organized by the host governments.

<table>
<thead>
<tr>
<th>MSP Meeting</th>
<th>Place</th>
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</thead>
<tbody>
<tr>
<td>2011</td>
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<tr>
<td>2011</td>
<td>Phuket, Thailand</td>
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<tr>
<td>2013</td>
<td>Nairobi, Kenya</td>
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<td>2013</td>
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<td>2014</td>
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<td>2016</td>
<td>Panama City, Panama</td>
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<tr>
<td>2017</td>
<td>Addis Ababa, Ethiopia</td>
</tr>
<tr>
<td>2018</td>
<td>Ulaanbaatar, Mongolia</td>
</tr>
</tbody>
</table>
9th Multistakeholder Partnership Meeting

Innovation in Sustainable Livestock

• Manhattan Kansas, USA
• 9-12 September 2019
  • Science Day
  • Policy Day (Innovation and trade panels)
  • Field Tours Day
  • Action Day
• 350 participants expected
• Preparatory workshop, March 2019
• Four Sustainability Domains
• USDA involvement (Donald)
Natural regeneration of native trees for the implementation of silvopastoral system for beef cattle production in Brazil

Key Messages

Significance - MSP (multi-stakeholder partnerships) is demonstrated as an effective and innovative model of the 100x100 Agri-investors in the strategy to use the silvopastoral system (SPS) to improve production, environmental sustainability and social benefits.

Goals - the higher biomass produced by the SPS gives greater security for cattle raising and financial viability for the farmers and also on benefits to the farm owners, farmers and communities by improving their social and economic security.

Economic - SPS stimulates greater biomass production throughout the year, improving the economic stability and the profits in cattle raising. The SPS allows higher stocking rates and more beef production per hectare compared to conventional range systems and offering opportunities for economic diversification (e.g., wood, charcoal, and biofuels).

Environmental - the environmental benefits generated by SPS are related to higher biodiversity, providing the service of increased biological carbon sinks and nutrient enrichment of pastures. livestock becomes a carbon drawdown for beef. This change in the current management of pastures, under the framework of SPS, will improve the production of native trees and bushes which reduces the need for chemical fertilizers for crops.

Livestock-based solutions

- Problem: overcropping and deforestation is an enormous social, economic, and environmental problem in Brazil.

- Solution: spontaneous natural regeneration of native trees and bushes associated to grass pastures is a sustainable solution to improve livestock production.

Results and evidence

- The area from the livestock system has doubled increased in comparison with traditional monoculture systems based exclusively on forage. 

- The resulting high biodiversity, flora, and fauna from silvopastoral practices has positively changed the farm landscape, which has enhanced carbon absorption, forage biomass, and animal welfare.

- These outcomes encourage farmers to adopt silvopastoral practices.

Multiplier effects

- This case study is the result of the efforts of several farmers, livestock suppliers, and experts in the field of sustainable livestock production (SILVA, Ribeiro, Almeida, etc.).

- The objectives achieved with SPS could also increase the adoption of the system by other farmers and consequently improve the sustainability of livestock production in the region.

- Scaling up the adoption of SPS depends on the cooperation of farmers to work and learn from other farmers already working with the SPS and demonstrating its benefits.

- It is expected that the economic, social, and environmental benefits of SPS would be valid for other policies and programs for sustainable actions (Challenges).

Partners

Global Agenda for Sustainable Livestock (GALS)

Agro-ecology (AGRO)

 Sustainable Agricultural Production Systems (SAPS)

Fundación Interamericana para la Desarrollo Sostenible (FIDES)

CIA en el CIP (National Committee for the Improvement of Livestock)

storage and information, services, and training institutions
Thanks!

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www.livestockdialogue.org

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Agenda

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