

Abstract Submission Form

Title (Mr./Mrs/Dr./Prof.)

Dr

Presenting author

Elly Navajas

Institute

Institute/company: Instituto Nacional de Investigación Agropecuaria

Adress: INIA Las Brujas, Ruta 48 km 10

ZIP/Postal code: 90200

City: Canelones

Country: Uruguay

Insert all authors and institutions

E.A. Navajas (1), J.M. Alvarez (2), F. Baldi (3), S. Munilla (4)(5), G. Ciappesoni (1), V.E. Vega-Murillo (6), R.J.C. Cantet (5), A. Berndt (7) and J.B.S. Ferraz (8)

(1) Instituto Nacional de Investigación Agropecuaria, INIA Las Brujas, Ruta 48 km 10, 90200 Canelones, Uruguay;

(2) Instituto Nacional de Tecnología Agropecuaria. Universidad Nacional de Río Negro - EEA Valle Inferior- UIISA Ruta nac. 3 km 971, camino 4, Idevi, Viedma 8500, Argentina;

(3) Universidade Estadual Paulista, Departamento de Zootecnia, Jaboticabal, 14884-900, SP, Brazil;

(4) Universidad de Buenos Aires, Facultad de Agronomía, 1417 Buenos Aires, Argentina;

(5) Instituto de Investigaciones en Producción Animal, INPA CONICET, Buenos Aires, Argentina;

(6) Facultad de Medicina Veterinaria y Zootecnia, Universidad Veracruzana, Veracruz, Ver, Mexico;

(7) Embrapa Southeast Livestock, São Carlos, SP, Brazil;

(8) Universidad de Sao Paulo, Departamento de Medicina Veterinária, Rua Duque de Caxias Norte, 225, Pirassununga, SP, Brazil

Preferred presentation

Oral

Preferred session

Session 8: Global challenges in measuring methane in ruminants

Email of corresponding author

enavajas@inia.org.uy

Title of your paper

Developing livestock breeding strategies for enteric methane mitigation in developing countries – the case of Latin America

Insert ABSTRACT text

Meat, dairy and wool industries are particularly important in Latin American (LA) countries given their significant contributions to national economies, generation of employment and rural development. Livestock industries are also relevant for ensuring food security in the region, and for the rest of the world attending the predicted increase in food demand of a growing global population. The LA region is responsible of 25% and 11% of the world beef and dairy production, respectively, with Argentina, Brazil,

Mexico and Uruguay being among the major beef and dairy producing and exporting nations. Reducing enteric methane emissions (ME) is one of the challenges that the livestock industry faces in Latin America. Cattle and sheep are major sources of greenhouse gas (GHG) emissions in LA, particularly ME which represents from 11% (Mexico) to 42% (Uruguay) of the total GHG emissions in the considered countries. Animal breeding provides the opportunity to harmonise production growth and ME mitigations targets in the framework of the Paris Agreement and the Global Methane Pledge. The most important *Bos taurus* (Angus, Hereford, Holstein), *Bos indicus* (Nelore, Brahman and Guzerá) and composites (Brangus, Braford, Montana) breeds have genetic evaluation in place in Argentina, Brazil, Mexico and Uruguay, some of them established 30 years ago. Similarly, wool, dual purpose and meat sheep breeds are genetically evaluated in Argentina and Uruguay. Genetic evaluations systems include relevant traits related to production (reproduction, growth, carcass weight, milk production, fleece weight), and product quality (meat intramuscular fat, milk protein content, fibre diameter). Feed efficiency, assessed by residual feed intake (RFI), has been recently incorporated to beef cattle genetic evaluations in Argentina (Angus, Brangus, Braford), Brazil (Nelore, Guzera and Brahman) and Uruguay (Hereford). Genomic information has been integrated in many breeding programmes of cattle and sheep. This is particularly relevant for difficult to measure traits, such as RFI and ME, although expanding the reference population sizes for improving prediction accuracies remains a difficult task. ME phenotypes for breeding purposes are still scarce in the region. In 2021, Uruguay started recording ME in Hereford, using GreenFeed units, during the RFI tests, and a similar approach will be implemented in Argentina in several breeds. An intensive phenotyping platform was developed in Uruguay for sheep, in which RFI and ME are measured. Based on data recorded with Portable Accumulation Chambers, the first genomic breeding values for ME have been published in Merino. The genetic evaluation system in these LA countries have been implemented based on associations between breed societies and academic institutions, including national research institutes and universities. These relevant and long-lasting collaborations between public and private sectors in Argentina, Brazil, Mexico, and Uruguay provide the basis for a coordinated regional programme for animal breeding strategies with the aim of mitigating ME and improve livestock performance. The critical step is implementing the phenotyping platform for ME for the main breeds. This implies improving ME recording in association with RFI and expanding it to grazing conditions. The first approach delivers key information to disentangle the links among feed intake, animal performance and ME. Data recorded in grazing animals allows investigating ME in the most relevant livestock production environment in the region, and potentially developing proxy measures for larger phenotyping carried out by breeders. Although feed intake, which is a main driver of ME, is very difficult-to-measure trait the information in grazing system would provide valuable data for quantifying methane intensities and estimating ME factors. An integrated and collaborative approach among the mentioned countries would be able to provide breeding tools and information for breeders to contribute to current and future challenges, considering environmental, social, and economic sustainability.

Enter keywords

genomic selection, sustainability, greenhouse gas, residual feed intake, cattle, sheep