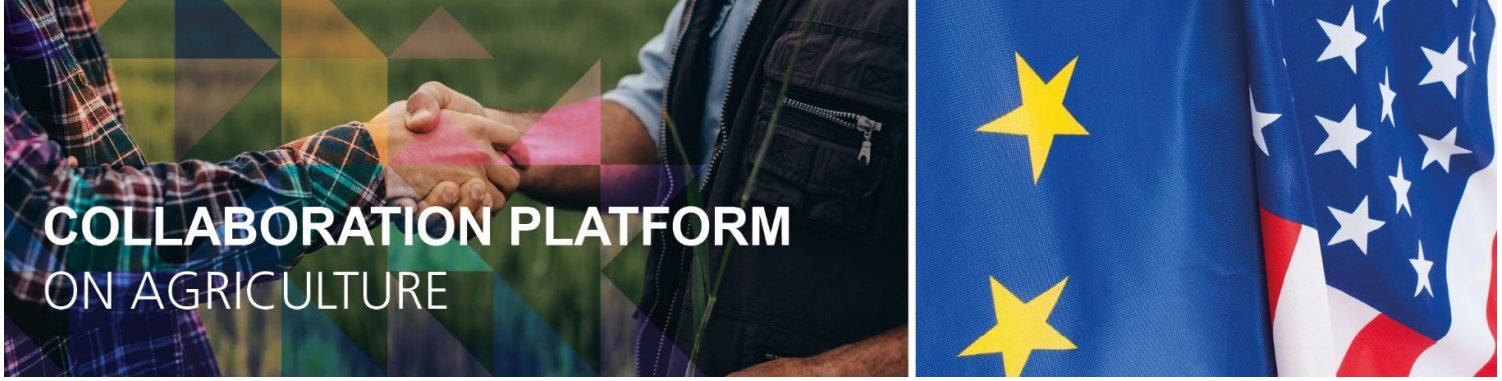

USDA-DG AGRI Virtual Event on Strategies to Reduce GHG Emissions from Livestock

On October 19, 2022, the Collaboration Platform on Agriculture (CPA) of the U.S. Department of Agriculture (USDA) and the European Commission Directorate-General for Agriculture and Rural Development (DG AGRI) hosted a meeting of U.S. and EU policymakers, academics and stakeholders on sustainable management of livestock to reduce greenhouse gas (GHG) emissions from enteric fermentation and manure management. Exchanges focussed on identifying challenges, technical solutions, management options, and policy needs.

Session 1: Policy frameworks in the EU and U.S.

Lead discussants: Kerstin Rosenow European Commission DG AGRI: Head of Unit Research and Innovation; William Hohenstein, Director, Office of Energy and Environmental Policy, Office of the Chief Economist, USDA.

The EU has clear targets to reduce Greenhouse Gas emissions by 2030. These flow from the EU Green Deal and Farm to Fork strategy and Methane strategy. Reporting and data collection needs to be improved. Help comes from the Common Agricultural Policy (CAP) public support framework. The EU's Research and Innovation (R&I) support aims to accelerate progress and help farmers mitigate and adapt to climate change. Examples in the livestock sector are feeding strategies, genetics, and manure management, which can be more supported under the new CAP eco-schemes. There are joint projects and initiatives with EU Member States such as ERA-NETs to pool resources on issues such as GHG mitigation, circularity, agroecology, breeding for resilience, and on animal health.

The European innovation partnership for agriculture directs and rewards scientists, advisors, practitioners, and farmers to solve specific on-farm problems. Results with this bottom-up approach have a farm-level impact with more than 2500 operational groups following a co-creation approach. On 13-14 December, the Cluster 6 "Food, bioeconomy, natural resources, agriculture and environment" EU Horizon research program has information days: opportunities for the EU and U.S. to work together. The EU is a member of the Global Research Alliance on Agricultural Greenhouse Gases (GRA) of 66 countries.

In the U.S., agricultural GHG emissions represent 10% of overall emissions. Methane is a focus because of short lifespan and high global warming potential. The U.S. has signed onto the Global Methane Pledge (reduce methane emissions by 30% globally by 2030). There is potential to make progress on millions of acres of improved rotational grazing, anaerobic digesters, and feed production. In USDA conservation programs, GHG issues are integrated, and progress tracked.

The USDA provides voluntary incentives to improve agricultural environmental outcomes through the Farm Bill conservation programs. However, the recently

approved Inflation Reduction Act also provides substantial resources (over $19 billion) for conservation, including on-farm energy projects specifically targeting GHG benefits. The bill also contains GHG inventory and assessment provisions to increase knowledge on quantification of carbon sequestration and agricultural GHG emissions.

USDA also launched the Partnerships for Climate-Smart Commodities, which recently awarded $2.8 billion for 70 projects to create new and expanded markets for climate-smart commodities, thus creating further market-based incentives for farmers to adopt climate-smart production practices. These projects will improve understanding of monitoring and verification – robust GHG benefits while balancing associated transaction costs. There is emphasis on efficacy and credibility in GHG quantification. Lessons-learned will be shared internationally, and it is hoped that lessons will also inform private carbon offset markets (ways to reduce transaction costs, improve quantification, and reduce confusion).

In the EU and U.S., there are data collection and harmonization issues – more to be done, while ensuring that farmer data remain confidential. In the U.S., methane emissions from animals are generally estimated using 2 factors: number of animals and management practices employed. USDA surveys report on livestock numbers and types. Farm management survey data are also collected and aggregated. Many farmers are interested in emissions from their own enterprises. The government is working on tools where farmers can log in and generate estimates of GHG savings.

In response to a question on the approval of the additive 3NOP to reduce emissions from enteric fermentation in Europe, the European Food Safety Authority (EFSA) manages the approval process. Trials are carried out globally. 3NOP is approved for use in dairy and approval is expected for use in beef. The use of 3NOP needs crediting into GHG inventories. Issues were identified in EU-U.S. collaboration on Horizon projects with data sharing and publication.

Session 2: Technical Exchange on Technologies, Accounting Systems, and Research Needs to Mitigate Livestock Emissions

Lead discussants: April Leytem, USDA Agricultural Research Service, Valerio Abbadessa, European Commission DG AGRI: Research and Innovation, Dr. Jan Dijkstra, Wageningen University, Juan Tricarico, Vice President for Sustainability Research, Dairy Management Inc.

In the U.S., the livestock GHG footprint per product has reduced thanks to gains in production efficiency such as growth promoting technologies. There is not a dramatic net reduction as production is increasing as demand is. No specific technologies are used to control enteric fermentation. 3NOP holds great promise but not yet approved. There are other promising avenues (seaweeds), however, no large-scale adoption. Some of the largest sources of emissions are extensive cow calf operations, and there is little management interaction. On manure management, solid separation is most common. There is some adoption of anaerobic digesters, mostly in large dairy operations, but this market is growing.

Emissions estimations are at the farm and national levels. Farm estimates are uncertain because there are few reliable measurements. Nationally, emissions estimates from cow calf operations represent significant uncertainty. Diet is not well known due to cow diet selection and changing forage quality. On manure, additional information would allow for a more comprehensive baseline of emissions and increase certainty in effectiveness of management practices.

In the EU, there is a variety of management practices. However, there is little evidence of productivity gains in those techniques, which is challenging for promoting adoption. The EU supports several R&I projects on GHG reduction, feed, feed additives, seaweeds, manure management & storage, microbiome, life cycle assessments, and sensors for real-time information. Integrating these approaches to combine mitigation and adaptation techniques is the goal, considering trade-offs between livestock production, ecosystems, and climate. One problem is that the GHG mitigation strategies implementation cost is not well known and can vary significantly across production systems. Farm level data is lacking.

Another problem is that technologies are system specific. Feed additives for indoor systems are little use to range systems. Some of the data are out of date, for example they may not reflect modern genetics and feeding practices. Some methodologies exist for volatile solids and liquid lagoons. There was a plea to not only concentrate research on feed additives. There is little information on plant breeding and forage quality and different kinds of roughages that have the potential to reduce emissions, as some plants have the potential to reduce enteric methane emissions. 3NOP shows potential as feed additive. However, in grazing systems, additional options are necessary. Seaweed has potential, but the active ingredient bromoform is problematic as a potential carcinogen. Animal genetics can also influence the rumen microflora, impacting emissions. Farmers need information on comprehensive management strategies.

A recent meta-analysis on 98 methods to reduce enteric emissions was cited. Only 8 were effective in reducing enteric fermentation with 3 increasing milk productivity. Long-term experiments are needed, also on dairy reproduction. In U.S. dairy production, nutritional aspects have been improved, but progress is needed in the beef sector. Another area of interest is the microbiome and interventions to influence the gut microflora. Selective animal breeding requires multiple generations; small changes accumulate over time. Other critical elements are socio economic conditions and markets. Identifying mitigation options are not enough; they need to be used by farmers in a favorable environment.

Session 3: Addressing Barriers to Implementation

Lead discussants: Leah Wilkinson, Vice President of Public Policy and Education, American Feed Industry Association; Professor Sinead Waters, Principal Research Officer in the Animal and Bioscience Research Department in Teagasc and Adjunct Professor at the Genetics and Biotechnology Laboratory, University of Galway; Jeff O'Hara, Economist, Office of Energy and Environmental Policy, USDA; Jean-Baptiste Dollé, Head of Environmental Department at French Livestock Institute.

In the U.S., any feed ingredient on which a nutritional claim is made goes into the Food and Drug Administration (FDA) approval pathway. Feed ingredient approval takes 3-5 years, sometimes 10, but is quicker than drug approval. Either pathway requires industry resources. Guidance is also needed on feed management plans. The approval process in the EU is similar – a rather slow process with animal trials. EU dairy went through the process for 3NOP, and EU beef is still going through the approval process. Additional barriers exist post-approval, including the cost of adoption. Who pays for its application if it does not improve farm profitability? Would it be the consumer or government incentives? Only 20% of consumers would consider GHG reduction in their daily shopping. How should these technologies be accounted for in national GHG inventories? Ease of delivery is a big issue. Research is still needed to overcome barriers.

Duplication of research funding should be avoided and funding resources put to a global use. Collaborative projects are critically important. In Ireland, an exciting initiative called the signpost programme works on research with farmers and extension. The programme focuses on farmer demonstration to increase credibility and is working well nationally and for EU partners. Incentives are needed to integrate technologies, and account for their benefits in national inventories.

Regarding harmonised product approval approaches, discussants agreed that there should be standards for evidence on effectiveness supported by publicly available data. Bad materials erode public trust irreversibly. For example, some natural products do not need approval but may contain harmful active ingredients. There was consensus that processes are needed to ensure safety and effectiveness. Consumers would react to any evidence of a residue in a product negatively.

On manure management, digesters are increasing in the U.S., and so is GHG mitigation from digesters. Strategies are under development to reduce GHG emissions and increase carbon sequestration in France and the EU. A survey with 20,000 farmers identified barriers to implementing GHG mitigation techniques. More farmer support and training are needed to demystify complexity for some farmers. Solutions may include linking GHG indicators and other environmental factors with production efficiency; training sessions for farmers & advisors; self-assessment; networking; and demonstration actions.

Another barrier is the complexity of reporting and auditing, often time consuming and complex assessments. A solution could be to consider GHG emissions and carbon sequestration as a whole farm approach with a robust but cost-efficient monitoring and reporting system, adapted to farm context. A third barrier is the financial burden. Not all mitigation measures are cost effective, and there are risks. Financial support to farmers through market-based mechanisms would help, such as "carbon farming" or carbon markets, price premiums and payments for ecosystem services.

Session 4: Takeaways and Next Steps

William Hohenstein, Director, Office of Energy and Environmental Policy, Office of the Chief Economist, USDA; Brigitte Misonne, European Commission DG AGRI: Head of Unit Animal Products.

While often there is a focus on differences, here the EU and U.S. are dealing with similar challenges and common issues. Many opportunities exist for collaboration. There are existing international initiatives to facilitate collaboration, including the GRA and the global methane hub, which could lead to greater international and interinstitutional collaboration. The U.S. will learn much from implementation of the Inflation Reduction Act and the Partnerships for Climate-Smart Commodities and would like to share results with EU. We need infrastructure to do so.

There are many U.S. and EU research projects. There is a common need for researchers and farmers to work together and identify solutions for a variety of farming techniques. Feed additive products have lengthy authorisation processes, but it ensures the product is safe. The barriers to climate-smart farming need to be identified. Getting consumers to accept and even pay for climate-smart agricultural products needs to work for farmers too. The EU and U.S. face similar questions and should take steps side by side.