

PLENARY SESSION 1, PART 1

Sustainable intensification – growth without depleting natural resources

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Dr. Frank Mitloehner

They were promising and welcome words for a pork industry at times under siege.

The University of California, Davis' Dr. Frank Mitloehner told the 2017 Banff Pork Seminar the world can reach targets of feeding the expected nine billion people by 2050. It will happen in part, he says, through intensification of livestock production.

"Indeed intensification provides large opportunities for climate change mitigation and can reduce associated

land use changes such as deforestation. Production efficiencies will reduce environmental pollution per unit of product," he says.

To do that requires separating fact from fiction in the greenhouse gas emission world, and it requires an understanding of real progress in livestock production efficiency, he says. Production success needs to be put in a global context, and it requires a fair way to assess emissions.

Fact and fiction in GHG

The 2015 Global Climate Change Conference resulted in 196 countries signing on to reduce fossil fuel use. While there is strong scientific consensus regarding the relative importance of fossil fuel use, anti-animal agriculture advocates portray livestock as to blame for the lion's share of greenhouse gas (GHG) emissions, says Mitloehner.

One common argument is that U.S. livestock GHG emissions from cows, pigs, sheep and chickens are comparable to all transportation sectors such as cars, trucks, planes and trains. That argument suggests that limiting meat consumption, starting with "Meatless Mondays" will have a significant impact on total emissions.

The reality is leading scientists have quantified the impacts of livestock production in the U.S., which accounts for 4.2 per cent all GHG emissions, very far from the 18 to 51 per cent range that advocates often cite. Comparing the 4.2 per cent GHG contribution from livestock to the 27 per cent from the transportation sector, or 31 per cent from the energy sector brings all contributions to GHG into perspective.

Breaking down the 4.2 per cent EPA figure for livestock by animal species, shows the following contributors: beef cattle 2.2 per cent, dairy cattle 1.37 per cent, swine 0.47 per cent, poultry 0.08 per cent, sheep 0.03 per cent, goats 0.01 per cent and other (horses, etc.) 0.04 per cent.

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"If all Americans practiced Meatless Mondays, we would reduce the U.S. national GHG emissions by 0.6 per cent," says Mitloehner. "A beefless Monday per week would cut total emissions by 0.3 per cent annually. One certainly cannot neglect emissions from the livestock sector, but to compare them to the main emission sources would put us on a wrong path to solutions, namely to significantly reduce our anthropogenic carbon footprint to reduce climate change."

Livestock's real progress

Fewer inputs, fewer impacts.

That's the bottom line for U.S. livestock production when all things are considered, says Mitloehner.

U.S. pork production per breeding animal is around 4,000 lbs. about double what it was in the late eighties. In 1970, the U.S. had 140 million head of beef; today there are 90 million. In both 1970 and 2010, 24 million tons of beef were produced.

Today, there are nine million dairy cows in the U.S., 16 million fewer than 1950. Yet comparing 1950 to 2013, milk production nationally has increased 60 per cent. The carbon footprint of a glass of milk is two thirds what it was 70 years ago.

Globally, the U.S. is the country with the relatively lowest carbon footprint per unit of livestock product produced (i.e. meat, milk, or egg). The reason for this achievement largely lies in the production efficiencies of these commodities, where fewer animals are needed to produce a given quantity of animal protein.

The average dairy cow in the U.S. produces 22,248 lbs. milk/cow/year. In comparison, the average dairy cow in Mexico produces 10,500 lbs. milk/cow/year, thus it requires 2-plus cows in Mexico to produce the same amount of milk as one cow in the U.S.

India's average milk production per cow is 2,500 lbs. milk/cow/year, increasing the methane and manure production by a factor of nine times compared to the U.S. cow. As a result, the GHG production for that same amount of milk is much lower for the U.S. versus the Mexican or Indian. Production efficiency is a critical factor in sustainable animal protein production and it varies drastically by region.

Improvements in livestock production efficiencies are directly related to reductions of environmental impact. Production efficiencies and GHG emissions are inversely related—when the one rises, the other falls.

Fairly assessing livestock emissions

In its quest to identify a sustainable, scientific path toward fulfilling the future global food demand, the Food and Agriculture Organization of the United Nations (FAO) has formed an international partnership project to develop and adopt a "gold standard" life cycle assessment (LCA) methodology for each livestock species and the feed sector.

The 'Livestock Environmental Assessment and Performance Partnership' (LEAP), engaged with more than 300 scientists from the world's most prestigious academic institutions in an unprecedented effort in developing a global benchmarking methodology. The

first three-year project was in December 2015 with six available LCA guidelines. This harmonized quantification methodology will not only allow the measurement by livestock species production regions across the world today, but will also identify opportunities for improvement and tools to measure that progress in each region going forward.

The 2050 challenge

Our natural resources of land, water, and minerals (fertilizer) necessary for agricultural production, have not grown in fact decreased, says Mitloehner. As a result, agriculture will have to become much more efficient worldwide to meet the challenge in an efficient path similar to the one it has traveled down in livestock production in recent decades.

China's five year plan which focuses on making farms larger and more efficient is an example. Half of the world's population live in China. That's 50 million pigs with 20 piglets born alive, or a total production of 1 billion pigs. Piglet mortality causes 400 million pigs never make it to the market. Cutting piglet mortality more would mean 1 billion more pig per sow would mean 1 billion tons of feed saved.

The five cornerstones of sustainable intensification

Here are the five fundamentals of sustainable livestock systems, says University of California, Davis professor Frank Mitloehner.

1. Financial
2. Animal welfare
3. Food safety
4. Workers availability and well-being
5. Environmental

People tend to think environmental sustainability when they think sustainability. Five are needed for sustainable systems, he says. ■

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