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Global Agenda for Sustainable Livestock

The Global Agenda for Sustainable Livestock (GASL) held it's annual Multi-Stakeholder (MSP) meeting in Dublin, at the invitation of the Government of Ireland.



What is the GASL?

The FAO hosted Global Agenda for Sustainable Livestock is a partnership of livestock sector stakeholders committed to the sustainable development of the sector. The private sector is represented on the steering committee by the FAO accredited global livestock sector organisations (IMS, International Dairy Federation (IDF), International Poultry Council (IPC), International Feed Industry Federation (IFIF), Health for Animals).

With global population projected to reach 9.6 billion in 2050, the livestock sector's role in sustainable food and agriculture will continue to increase. To be sustainable, livestock sector growth needs to simultaneously address key environmental, social, and economic challenges: growing natural resources scarcity, climate change, widespread poverty, food insecurity and global threats to animal and human health.

The GASL builds consensus on the path towards sustainability and catalyzes coherent and collective practice change through dialogue, consultation and joint analysis.

The partnership unites the forces of the public and private sectors, producers, research and academic institutions, NGOs, social movements and community-based organizations, and foundations (www.livestockdialogue.org).

The GASL:

- Recognizes the multiple ways that sustainable livestock enhances the lives of at least 20% of the world's population who derive livelihoods and food and nutrition security from livestock; provides affordable and often essential nutrition, offers pathways for women, men and young people to take advantage of economic and social opportunities; and brings solutions to help tackle environmental and public health challenges.
- Recognizes the valuable contribution of the Global Agenda for Sustainable Livestock to continuous and open dialogue between local, national, regional and global stakeholders. This supports innovative policy and practice change towards sustainable livestock development-centered around four livestock sustainability domains: food and nutrition security, animal health and animal welfare, livelihoods and economic growth, and climate and natural

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resource use.

- Reaffirms commitments of the Global Agenda for Sustainable Livestock to the United Nations Agenda 2030 for Sustainable Development and engagement in global development processes, such as the United Nations Food Systems Summit, Committees of Parties highlighting the special role that livestock can play for people, planet and prosperity.

Main Agreed Outcomes/ Commitments from the Dublin meeting:

- Highlighting evidence and practice changes that result in balanced, nutritious and sustainable diets including the choice of healthy livestock-derived foods and contribute to food and nutrition security.
- Promoting the application of fair, inclusive and equitable livestock business models and opportunities that contribute to economic growth, sustain livelihoods and grow employment for women, men and youth, leaving no-one behind.
- Fostering production, management and stewardship of livestock and their products to reduce GHG emissions, enhance land, soil and nature biodiversity, improve sustainable water use and deliver climate adaptation co-benefits for a healthier planet.
- Promoting the highest standards of animal health and welfare globally.
- Working collaboratively in partnership with GASL stakeholder clusters and other stakeholders to achieve our common food system goals, including with the recently established Sub-Committee on Livestock of the FAO Committee on Agriculture.
- Contributing to a nuanced debate that recognizes importance and diversity of livestock-based solutions required for sustainable development.

How allocation methods at slaughterhouse stage can affect the environmental impact of meat

Life Cycle Assessment (LCA) methodology is one of the most widely used methodologies to study the environmental impact of a product.

In 1993, a formal standardization process was initiated under the auspices of the International Organization of Standardization (ISO) to develop a global standard for LCA. However, the ISO standards leave a great deal of freedom for the LCA practitioners, e.g., when defining system boundaries, functional unit, allocation approach, and identification of representative impact categories.

One of the most debated aspects in LCA studies is the question of allocation when dealing with a multifunctional process, e.g., when an animal enters the slaughterhouse and is split between edible products for human consumption and inedible by-products sold to different sectors, e.g., pet feed, biogas, biodiesel, pharmaceuticals, etc. How should we allocate the total upstream emissions between the products and by-products?

This question of allocation at the slaughterhouse level was also discussed during the PEF initiative from the European Commission, which sought to harmonize the LCA methodology and establish a ruleset on how to calculate the environmental footprint of a specific product group. Due to the lack of agreement among the involved industries, a common Red Meat PEFCR methodology was not finalized.

The purpose of the study by Al-Zohairi et al. 2022 published in the *International Journal of Life Cycle Assessment*, was to evaluate the effect of different allocation procedures at the slaughtering stage on the LCA results. A case study on Danish pork products was carried out, but the results also apply to other geographical areas and animal species. Furthermore, an evaluation of the consequences of using different allocation methods was assessed and how the various allocation methods provide incentives and drive the sector in a more sustainable direction.

The study followed a cradle-to-slaughterhouse gate LCA approach. The functional unit was one kilo of pork for human consumption, including meat products and edible by-products. The analysis was performed using four different allocation methods at the slaughterhouse level: 1) mass allocation, 2) biophysical allocation, 3) system expansion, and 4) economic allocation. Moreover, a sensitivity analysis was conducted on the price fluctuations within the economic allocation.

Key findings

1 Different methodologies - different results

Depending on the allocation

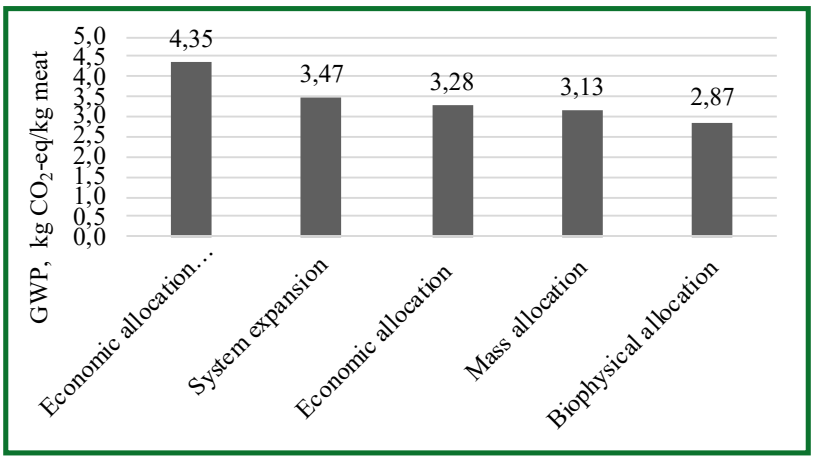


Fig. 1 Results on global warming potential (GWP) per kilo meat (adapted from Al-Zohairi et al. 2022).

method applied at the slaughterhouse level, the carbon footprint of pork for human consumption varies between 2.87 kg CO2-eq/ kg meat and 4.35 kg CO2-eq/ kg meat, which is more than a 30% difference between the two results, just by using a different allocation procedure, see fig. 1. This shows that the choice of allocation method at the slaughterhouse level highly affects the LCA results of meat, even though the slaughterhouse itself only has a minor contribution to the environmental impact of pork production compared to the farm stage.

2 Advantages and disadvantages of the four methodologies

The four allocation methods have advantages and disadvantages that are closely related to the intended use of the assessment. If slaughterhouses can utilize more of the slaughtered animal for human food, thereby reducing food losses, there would be a large mitigation effect on the environmental impacts per kilo of meat, which is also assessed in the study by Mogensen et al. 2016 published in the *Journal of Cleaner Production*. It is therefore important that the choice of allocation procedure can capture the measures to mitigate environmental impacts. Thus, the allocation method should not only be stable, robust, and scientifically sound but also incentivizing.

2.1 Mass and biophysical allocation

In this case, mass and biophysical allocation falls short because they do not stimulate to a higher utilization of the live animal for human consumption, as all products and by-products get the same environmental impact per kilo product. For example, with biophysical allocation, which considers multiple characteristics of all parts of the produced body tissues of the animal (e.g., protein and lipid content), it 'costs' the same amount of energy input for producing one kilo meat products for human consumption as for producing one kilo of by-products used for other purposes, and thereby the results would be the same environmental impact between products sold for human food and inedible by-products for pet feed, biogas, and rendering.

The consequence of this would be that companies are more reluctant to make large investment projects to avoid downgrading by-products or upgrading category 3 by-products for human consumption because no environmental claim can be made. Low-value products risk to be downgraded even though they are fit for human consumption due to e.g., lack of packaging and freezing capacity, storage, and new technologies.

Moreover, by applying mass allocation at the slaughterhouse level, the inedible by-products are given a high environmental impact (same as for edible products), making buyers of by-products less inclined to use the by-products as raw materials in their production.

2.2 System expansion

Compared to the value-based allocation methods, system expansion received less attention in the development of the PEFCR guidelines. One of the main reasons for this is that system expansion is considered mainly an approach used in consequential LCA studies, and PEFCR is based on an attributional modelling approach. However, system expansion was considered in the study, and the results show that this approach better indicates the avoided impacts when animal by-products are used for certain purposes. The approach also provides incentives to increase the utilization of live animals for human consumption.

However, a disadvantage of system expansion is that the effect on decision-makers and other actors when changing the demand for one product from a multifunctional process can be hard to predict and model. Moreover, the approach is not feasible when a substitutable product does not exist, e.g., synthetic heparin or when data inventory is lacking. Lastly, most of the substitutable products also come from a multifunctional system, which can lead to circular reasoning as well as introduce many assumptions and uncertainties in the assessment.

2.3 Economic allocation

On the other hand, economic allocation better reflects the drivers behind the production and its entire existence. If no value is generated, the production stops, and so will

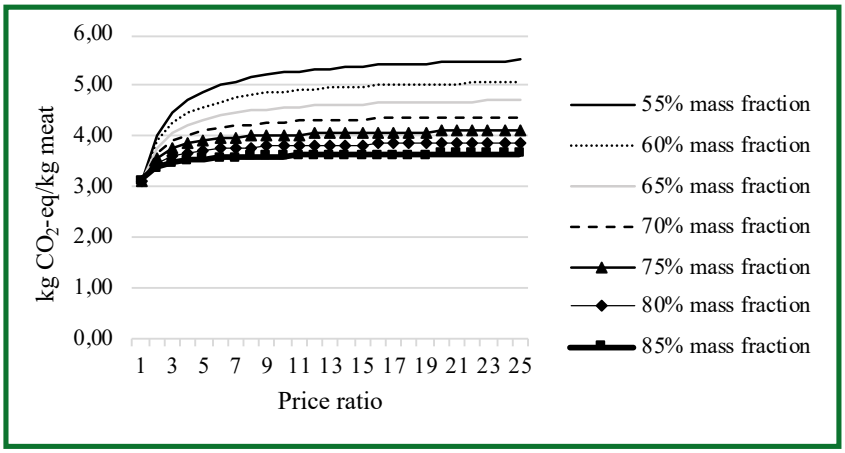


Fig. 2 Changes in GWP for meat due to price ratio and mass fraction (Al-Zohairi et al., 2022).

the environmental impacts. With this allocation method, there is a strong link between environmental and economic performance, and it gives an incentive to use more of the animal for human consumption, see fig. 2. However, this entails free mass fractions and allowing companies to use primary data, which is against the current recommendations in the PEFCR guidelines. The use of primary data instead of the secondary data suggested in the PEFCR showed a 10% decrease in the environmental impacts of meat because the company-specific mass fraction was 89% of live animals was used for human consumption, and the fixed mass fraction in the PEFCR was 81%. The use of primary data allows differentiating between the meat producers and credits those who make initiatives to utilize more of the animal for human consumption and drives the sector in a more sustainable direction.

One of the most common misconceptions and prominent industry arguments in the PEFCR Red Meat process against economic allocation was that the results are sensitive to price fluctuations. Even though prices are volatile on some products, the LCA results are considerably less sensitive when assessing whole streams instead of single products. Economic allocation is, therefore, stable despite price fluctuations in the market because the share in the total proceeds remains stable over time, see fig. 3. In addition, average prices can be used for all meat producers to create a leveling playing field and ensure that the competing factor for the meat processors, aiming at lowering the environmental impact of meat, should be increasing the share of live animals for human food purposes.

Conclusion and recommendations

There is a strong need for standardizing procedures for allocating at the slaughterhouse level; otherwise, comparing environmental performance between products and studies would be impossible. Therefore, the recommendation was to use economic allocation when handling the multifunctional issue at the slaughterhouse level as it gives the proper incentive structure to increase the share of live animals for human food purposes.

Lastly, it is essential to emphasize that the allocation method is not a mitigation strategy in itself because the total environmental impact is the same regardless of the choice of allocation rule. Therefore, it is more important to reduce the entire system's environmental impact than a single product's impact.

The total environmental impact is only reduced when the choice of allocation method leads to changes in how different side-biomass-streams are used, and it is becoming more relevant when companies are bound by legislation to reduce environmental impacts of their products. Food loss reductions can also be a way to decrease the environmental footprint of products, and then it becomes crucial that the allocation procedure can capture this measure.

If you are interested in reading more, further information can be found in the article by Al-Zohairi et al. 2022 **at this link.**

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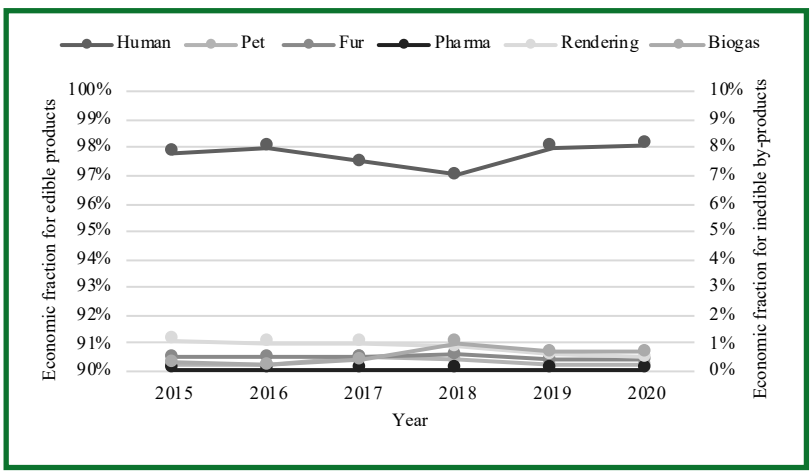


Fig. 3 Economic fraction of edible products and inedible by-products.

A meat building boom

The U.S. livestock industry is making a big investment in brick and mortar.

Perhaps surprisingly, given a volatile economic climate, high inflation, an uncertain political situation, and, certainly not least, continued drought, American beef producers, state governments, and agricultural agencies are making substantial investments in new and expanded facilities, from major mega-packinghouses to small, local or regional abattoirs.

In August, Governor Greg Abbot of Texas announced that a US $670 million state-of-the-art beef processing facility would be built next year in the city of Amarillo. The new plant, owned and to be operated by a new company called Producer Owned Beef LLC, is the beneficiary of more than US$12 million from the Texas Enterprise Fund and an additional US$11.1 million in tax incentives funded by the Amarillo Economic Development Corporation.

In a statement, Gov. Abbot commented, "Producer Owned Beef's selection of Amarillo for its new beef processing plant further reinforces the [Texas] Panhandle as a leader in U.S. beef and beef production and will create over 1,500 new jobs and millions in investment for the region. We welcome Producer Owned Beef to Amarillo and look forward to working with the company to keep Texas the economic engine of the nation."

The World's Largest?

Meanwhile, in South Dakota, a group plans to build no less than the world's largest beef packing facility. The group, led by Kingsbury and Associates and Sirius Realty of Rapid City, S.D., announced plans last June to build a US$1.1 billion state-of-the-art beef and bison processing plant that would harvest 8,000 head per day. The plant would encompass 1 million square feet and employ 2,500 workers. Megan Kingsbury, president of the group and managing partner, told *Drovers Journal*, "This will be a next generation plant, the only plant of its type in North America. This will be a tech-driven plant."

According to *Drovers*, the project is currently in a six-month research and development phase, with groundbreaking expected in early 2023. Kingsbury is a fifth-generation rancher raised on a family ranch, and she says she knows how difficult it is for ranchers to operate profitably in today's economic environment. "I want to fix that," she said.

"Our aim is to restore competition in American meat processing. We want to compete with the big four meat packing giants and be that all-important 'second bidder' in the cash market. We will build a brand that is America-first focusing on procuring American cattle and feeding American citizens affordable, high-quality protein as our first priority."

To be sure, both of these projects will be sailing against the winds of history. In general, producer-owned and/or operated beef operations have not succeeded. There have been notable exceptions, of course, the old Monfort of Colorado and the still-running Coleman Natural Beef among them, but history over the past four decades has shown that only the largest corporations have the capital required to keep a large beef packing company operating across the hills and valleys of American food economics.

Betting on Tech

The group in South Dakota thinks an emphasis on technology, including artificial intelligence and robotics, will help it overcome that history. The plant will operate with 20 per cent fewer employees than similarly sized beef plants, and many employees will be highly skilled industrial and computer engineers — Kingsbury said that if the plant opened today, the starting wage would be US$28 per hour.

She added that new technologies will enable the plant to process cattle more safely and efficiently and at the same time operate in an environment-friendly manner. "We want this plant to be a carbon neutral plant," Kingsbury told *Drovers*. "We are going to capture the methane to help power the facility, utilize energy resources, recycle a majority of the water used daily, and continue work on efficient transportation plans."

The Texas plant expects to process 3,000 head per day with 1,600 employees, with an annual payroll of US$121 million. Producer Owned Beef, LLC says that increasing beef packing capacity will shore up the supply chain and protect food security while increasing competition and thus benefiting cattle producers. "Our commitment

is to build and operate a beef processing facility that stands out from the rest of the industry in animal well-being, environmental protections, team member safety and ergonomics, and the highest quality beef products," said Casey Cameron, Producer Owned Beef's CEO in a statement.

The company claims its business model "restores balance in the beef industry by reversing compensation disparities cattle producers currently face. As owners of the company, producers will receive a percentage of wholesale beef prices for the cattle they supply and a share of the profits from the plant."

Investing Locally

On a much smaller scale but, in its region, no less significant than the big South Dakota and Texas investments, more than US$1 million is being invested in small-volume meat processing operations in the state of Vermont. Historically a dairy-farming area, Vermont has always had an abundance of local meat operations, often called "locker plants" because local residents can rent chilled lockers to store the meat they buy from the plant.

One US$75,000 investment in Vermont enabled the Higley Hill packinghouse in the town of Wilmington, Vt., to upgrade to meet the sanitation requirements set by the U.S. Department of Agriculture, enabling Higley Hill to sell to supermarkets and across state lines. "There's absolutely no question that once we've gone USDA, the phone has been ringing off the hook," Higley's manager Hogan Sennett told Vermont Public Radio (VPR) last month. "We were able to, since we started operating under inspection, basically fill our 2022 calendar in a matter of months. So we're pretty much booked out for the remainder of this year."

Abbey Willard, who works for The Agency of Agriculture, Food and Markets in Vermont, said, "The entire kind of sector has not seen the kind of infrastructure investment that is needed in a long time. And so there is a constraint on the growth of livestock operations and poultry in Vermont, based upon the slaughter capacity that they can find in state."

The number of beef cattle and pigs in Vermont has more than doubled in the past 10 years, as the hunger for local meat grew. However, the number of people working in slaughterhouses, as well as modernization investments, have not kept pace, and Willard told VPR it could cost $15-20 million to meet the need.

"We continue to identify this as an infrastructure investment priority from the Vermont Agency of Agriculture's perspective, and looking to, you know, state dollars to make investments ongoing, and exploring other federal resources," she said. "So we haven't given up that this is ... we have not solved this problem, and I wouldn't say that this has been removed from our priority list yet. This still sits at or near the top."

Fifteen years ago, Carl Cushing bought a small packing facility in Ferrisburgh, Vt., that had been in operation since the 1950s. He's focusing on working with young farmers and ranchers in Vermont who he says see a future for the Vermont livestock industry. "These people believe that they can expand their operations simply by being able to have a supply that they know they can get processed to put it into the marketplace," he commented to VPR.

"And a lot of folks are trying to utilize the good land that we have here, and what that land produces so they're providing a good quality product, and they can be proud of it. And that's kind of where I'm at with… I want to be able to help that."

Steve Bjerklie, Contributing Editor, Meat & Poultry Magazine; correspondent, The Economist.