Food and Agriculture Organization of the United Nations

ENVIRONMENTAL PERFORMANCE OF PIG SUPPLY CHAINS

SUMMARY OF THE GUIDELINES FOR ASSESSMENT

OVERVIEW

TIn 2013, 113 million tonnes of pork carcass was produced globally; and 98% of pork production originated in three regions: Asia (57%), Europe (24%) and the Americas (17%). It is interesting to note that China contributes about 48% of global pork production, followed by the USA with 10%.

The world's pig population increased by 8% between 2005 and 2013 reaching 977 million head: i) Asian countries accounted for 60.4%; China alone had 482 million pigs; ii) Europe accounted for 18.8%; Germany had 27.7 million head; iii) the Americas accounted for 16.6%: in South America, Brazil dominated with 36.7 million pigs; the USA had 64.8 million head; iv) Africa accounted for 3.7%; and Oceania accounted for 0.5%.

The main tangible product is meat: the pig sector is the largest contributor to global meat production, accounting for 37% of the 296 million tonnes carcass weight produced in 2010. Backyard production accounted for 19%, intermediate production for 20% and large-scale production for 61% of carcass weight production.

Global production of pork has doubled in the last three decades: in Asia production increased 3.5-fold, and in the Americas, production increased by 1.7-fold. Pork production in Europe increased from 21.8 million kg in 2005 to 21.9 million kg in 2013. China has led this growth, contributing 70% of increased production. Demand for pork projected to rise by 32% by 2030, which will put additional pressure on natural resources. This is of particular concern since the livestock sector already has a major impact on natural resources, using about 35% of total cropland and about 20% of green water for feed production. Hence there is growing interest from the pig and other sectors in measuring and improving environmental performance.

There are wide differences in the scale, goals and types of system that produce pigs. These systems may range from smallholder backyard subsistence systems (in developing economies) to backyard systems that are small-scale but not subsistence-oriented. There are also various types of indoor systems, including some that allow outdoor access with or without safeguards against infectious diseases and/or protection against predators. Some systems offer detailed management and housing prescriptions (e.g. organic production systems). This diversity means that there is a great variety of production systems with different production intensities and purposes within and among countries.

CHALLENGES AND SOLUTIONS

According to Gerber *et al*., (2013), pig supply chains are estimated to produce 0.7 billion mt CO_2e per annum, accounting for 9% of the emissions from the global livestock sector. Although these emissions are comparatively low, the scale of the sector and its rate of growth mean that reductions in emission intensity are needed.

While there is large variation in sources of emissions for different production systems, it has been reported that global feed production contributes 60% of GHG emissions. Of this, 13% arises from changes in land use resulting from the expansion of soybean crops to supply the protein component of feed, and 17% arises from N_2O emissions during the use of synthetic fertilizers and manure to grow crops for animal feed. The remaining contributions to the emissions from feed production include field operations, transport, processing and embedded energy from fertilizer production.

Manure storage and processing are the second largest source of GHG emissions, accounting for 27.4%, of which 19.2% are in the form of CH_4 predominantly from anaerobic storage systems in warm climates; the other 8.2% are in the form of N_2O. Of the 13% remaining, 6% arise from a combination of post-farm processing and transport of meat, 3% from direct and indirect energy use in livestock production, and 3% from enteric fermentation.

Post-farm emissions from processing and transport account for 5.7% of total GHG output. On-farm energy consumption accounts for only 3.5% of emissions, but when other indirect and direct energy uses in post-farm activities and feed production are added, overall emissions from energy use amount to 33%.

Conscious of these challenges, LEAP Partnership established in 2015 a technical advisory group to develop comprehensive guidelines on the assessment of the environmental performance of pig supply chains. Through consensus building, TAG experts from all regions of the world developed the guidelines, which strive for alignment with international standards such as ISO 14040/44 and IPCC guidelines. These guidelines are relevant for pig production systems: backyard, intermediate and industrial and provide methods to assess for greenhouse gas emissions, land occupation and energy demand and are illustrated with case studies. LEAP guidelines are transparent and comprehensive because different review processes were undertaken, from peer-review to public review. They provide transparent allocation rules between co-products, data collection and data quality assessment, inventory and they address interpretation and reporting of results supported by uncertainty and sensitivity analysis

LIVESTOCK ENVIRONMENTAL ASSESSMENT AND PERFORMANCE (LEAP) PARTNERSHIP

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