



**Food and Agriculture
Organization of the
United Nations**



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ENVIRONMENTAL PERFORMANCE OF POULTRY SUPPLY CHAINS

SUMMARY OF THE GUIDELINES FOR ASSESSMENT

OVERVIEW

The poultry sector, which includes chicken, turkeys, guinea fowl, geese, quails, ducks and pigeons, is dynamic and growing. Poultry is the most diffused domestic animal species in the world. The global poultry population in 2012 was estimated at just over 28 billion birds, over three times as many as in 1980, with chickens (including nearly 6 billion laying hens) making up approximately 90 percent of the total. Other poultry including ducks, geese and turkeys make up 6 percent, 2 percent and 2 percent, respectively. Quail eggs are also produced, mainly in Latin America, Asia and Europe. In 2012, global poultry production was estimated to be over 93 billion kg of meat and 67 billion kg of shelled eggs, growing at 3.6 and 2 percent per year, respectively. Modern poultry production systems emerged in the late nineteenth century in Europe and America, as breeders focused on improving meat and egg production, and it has subsequently spread across the globe. Specialization in raising broilers and layers has been important to the

sector's expansion. Growing populations, greater purchasing power and increasing urbanization have been strong drivers of growth.

The poultry sector is structurally diverse. There are wide differences in the scale, goals and types of system that produce meat and eggs. These may range from smallholder backyard subsistence systems (in developing economies) to backyard systems that are small-scale but not subsistence-oriented (in developed countries). 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

The production of poultry products, however, is associated with significant use of natural resources such as land, water and nutrients and contributes to the environmental issues such as greenhouse gas emissions, loss of nutrients to water and air and biodiversity loss. These problems may contribute to environmental impacts such as climate change or eutrophication, which threaten ecosystems and human health. The production of poultry meat and eggs is estimated to account for 8 percent of the global annual emissions of GHGs from the livestock sector, or 606 billion kg of CO₂e, with about half coming from feed production. The average emission intensity of broilers is estimated at 5.4 kg of CO₂e per kg of carcass weight, and for layers at 3.5 kg of CO₂e per kg of eggs. Poultry production is highly dependent on imported feed in large-scale operations. Such production is responsible for 57 percent of the sector's emissions, including 18 percent from land-use change to accommodate more feed crops. Emissions associated with manure storage, removal and processing are also significant, at 11 percent.



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Gerber et al. (2013) estimated the mitigation potential for reducing GHG emission chains at 14 percent. This estimate is based on several assumptions, including constant output, no farming system change and the adoption of efficient production practices: improving feed conversion, optimal manure management, and reduction of animal mortality in backyard systems and improved animal health care. However, the expected growth of the sector means that mitigation options will need to address both emission intensity, as well as total emissions generated by increased demand. The assessment of these impacts, however, is challenging due to the globalisation of poultry supply chains as well as the lack of data and harmonisation of the scientific method. For example, the uncertainty in data and methods for carbon footprint can lead to diverging results, which could lead to a wrong policy decision or improvement measures.

Conscious of these challenges, the LEAP Partnership established in 2013 a technical advisory group to develop comprehensive guidelines on the assessment of the environmental performance of poultry supply chains. Through consensus building, TAG experts from all regions of the world developed the guidelines, which built on international standards such as ISO 14040/44 and IPCC guidelines. These guidelines are relevant for all poultry production systems and provide methods to assess greenhouse gas emissions and energy demand and are illustrated with case studies. Figure 1 describes an example of the system boundary of the poultry supply chains covered in LEAP guidelines. These 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 and they address data collection and data quality assessment, inventory and interpretation and reporting of results supported by uncertainty and sensitivity analysis.

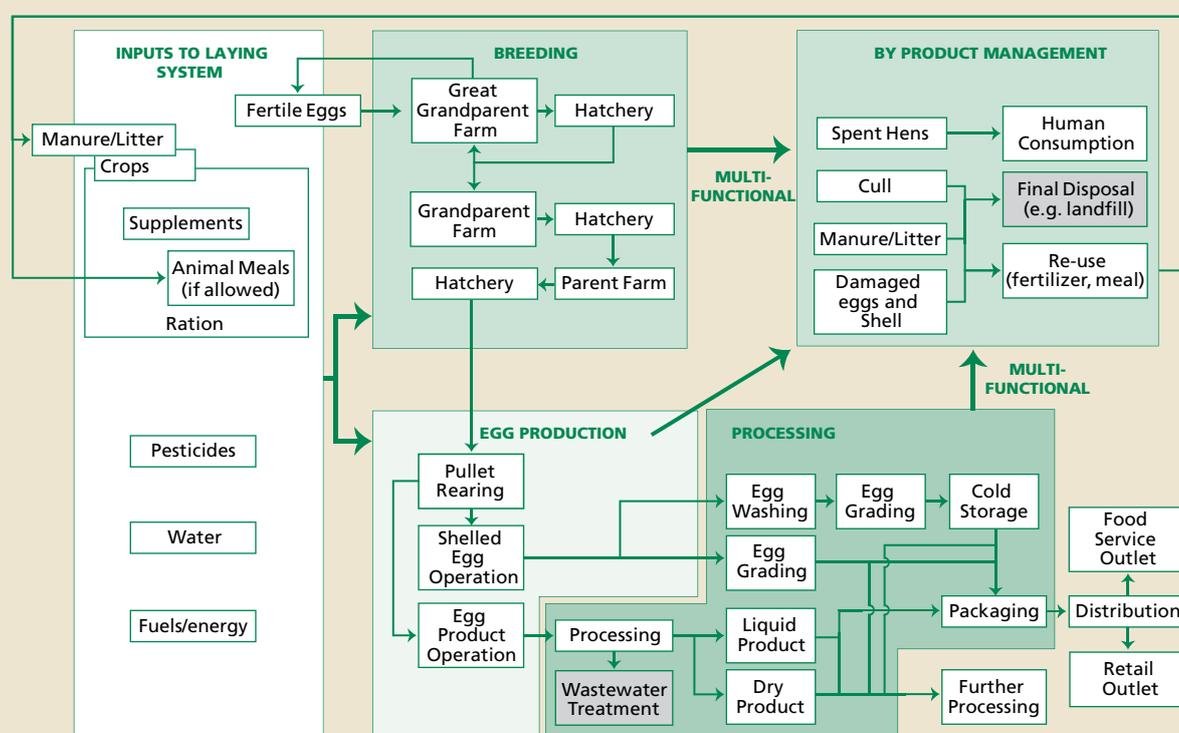


Figure 1. Schematic of poultry supply chain covered by LEAP guidelines