

Improving the efficiency and sustainability of meat production

Livestock is the fastest growing agricultural sector globally with meat production expected to more than double between 2001 and 2050, to 465 million tonnes each year. A third of all arable land is used to raise feed for livestock and the industry as a whole uses some 30% of the entire land area of the earth.

The UN considers the production of livestock to be one of the most significant contributors to environmental problems, such as the production of greenhouse gases and degradation of land and water resources.

No wonder meat is an easy target for those who believe that the human race should be looking for a more efficient and sustainable method for feeding the ever growing global population.

New ideas and technology

Against that background, any new idea or technology that can help deliver an improvement in the efficiency and sustainability of meat production has got to be good news for the global industry.

The standard methodology which is used to assess the sustainability and environmental impact of any product or process is life cycle assessment (LCA).

From pasta to power stations, LCA is being used by manufacturers and service providers to prove and improve their green credentials against a background of increasing consumer concern over environmental issues.

LCA examines every stage of the product's life, from its creation to its disposal, and assesses the resources used and the waste products produced as a result. The total impact is often expressed in terms of the 'carbon footprint' which gives an overall indication of the environmental impact of the product and its use. The carbon footprint is a measure of the total greenhouse gas emissions and is usually expressed in units of carbon dioxide equivalent (CO₂e) – often in kg or tonnes.

This figure is calculated by measuring all of the greenhouse gases produced and converting them to the carbon dioxide equivalent. This makes comparison between different products or activities much sim-

pler. Greenhouse gases include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride.

Life cycle assessment

The National Pork Board (NPB) in the USA recently commissioned an LCA of the US pork supply chain by the University of Arkansas' Applied Sustainability Center.

The study revealed that crop production, manure management and retail distribution and consumption had the most impact.

Pig production, from nursery to finish, accounted for some 60% of emissions, principally due to feed and manure handling; retail and consumer parts of the chain each accounted for less than 10%.

A similar LCA funded by the Australian government and Australian Pork Ltd was conducted because 'The pork industry, together with many other agricultural industries, has come under increasing pressure to quantify important environmental impacts and resource usage from the production of pork'.

The results were broadly the same as the US study, with feed and manure accounting for the major part of environmental burden.

While pork may not be the worst offender in terms of environmental impact – lying as it does somewhere between poultry at the lower end of the scale and beef/dairy at the upper end – the opportunity to benchmark and improve its green credentials is valuable one which is being taken very seriously at a very high level in major markets.

The vaccine option

Today's method to ensure good quality pork (free of boar taint), physical castration, is however inefficient because it robs males of their natural boar-like growth, resulting in a poorer feed conversion and a fatter carcass.

Not surprisingly, many producers are now switching to a more modern method of rearing boars which allows them to grow naturally for most of their lives, but while still reducing the risk of boar taint as effec-

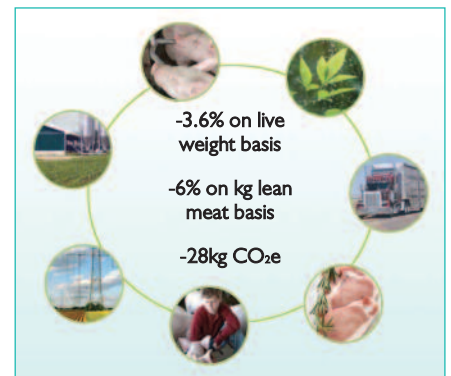


Fig. 1. Carbon footprint reduction of Improvac pigs compared to physically castrated ones.

tively as castration: vaccination. But how much difference does the vaccine have on the overall efficacy of pig production and, in particular, on the amount of feed it takes to produce a kg of pork?

To answer that question, an LCA was carried out last year to compare swine production using castration and vaccination.

Data was collected from swine production units and slaughterhouses from around the globe, including China, Japan, Canada, USA, and South America. The data was then analysed using computer modelling developed by LC Engineering (experts for the EU Commission).

This comprehensive life cycle assessment (LCA) has confirmed that the vaccine is a more environmentally responsible method of pig production than physical castration. The vaccine reduces pig and pork production carbon footprint by about 6% compared to physical castration for every kg of lean meat produced, which is equivalent to about 28kg less CO₂e for every pig raised to 115kg.

The LCA confirmed the findings of previous studies which demonstrated that feed and slurry were by far the biggest contributors to the environmental burden of swine production. The production of the vaccine itself (two doses) accounted for just 0.01% of the total carbon footprint.

These results are explained by the fact that vaccinated pigs convert feed more efficiently

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than castrated males because they spend most of their time as entire males, benefiting from their full growth potential.

This has a number of practical benefits to the production system and the environment:

- The reduction in feed required to raise pigs has the added benefit of reducing the amount of waste they produce, which is the major source of greenhouse gases and environmental burden. The LCA found that vaccinated pigs generate around 60 litres less waste compared to castrated animals, when raised to 115kg live weight. That is equivalent to a tanker truck of waste for every 500 pigs.

- Each pig raised to 115kg using the vaccine required 18kg less feed over its lifetime compared to a pig that had been castrated. That is equivalent to a 9,000kg feed hopper for every 500 pigs. At a time when feed prices are high in most markets that represents a welcome saving for the producer. If all the male pigs in Europe were vaccinated that would be equivalent to removing 1.6 million cars from the streets per year.

The LCA findings have been certified by Bureau Veritas and granted an international Environmental Product Declaration (EPD). They were also presented to environmental

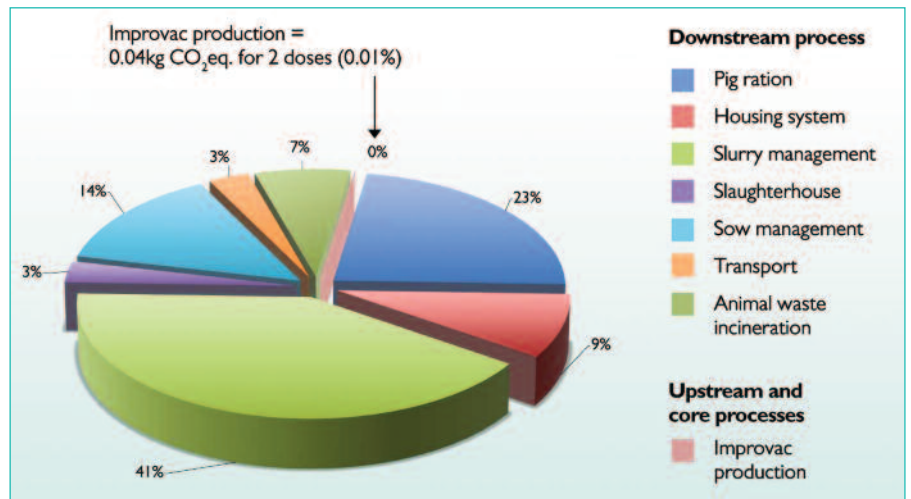


Fig. 2. The most relevant contributors to the carbon footprint indicator of the Improvac system

experts at the recent SETAC (Society of Environmental Toxicology and Chemistry) conference in Milan.

Worldwide approval

The vaccine is now approved in over 60 countries worldwide, including every major pork producing market, and largely used in Brazil and China amongst other countries.

If the CO₂ reduction figures are extrapolated onto a global scale, the reduction in

feed represents a significant saving in terms of agricultural land required and thus an improvement in the sustainability of pork production.

There is no doubt that the livestock and meat producing industries have made major advances in efficiency over recent decades and have contributed significantly to our ability to provide the growing global population with a supply of quality food. Embracing new ideas and new technologies will be essential if we are to continue that momentum over the next few decades. ■