

Sustainability mitigating tools for the Danish pig production

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Danish Agriculture & Food Council
Pig Research Centre

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The Danish pig producers have over the last decades achieved significant reductions in emissions of nitrogen, ammonia and phosphorous. This has been achieved through biological technologies and innovations in feed and breeding. Additionally, the Danish government has in 2024 in collaboration with Danish Agriculture and The Danish Nature Conservation Society agreed on a plan, The Green Triparty Agreement, which includes further measures for nitrogen reduction.

This document contains information on biological innovations and technologies which have significantly reduced the environmental footprint for the Danish pig production.

Innovations in feed and breeding reduce the environmental footprint

Two biological innovations and technologies have had significant impact in reducing the environmental footprint of Danish pig production; breeding programs to increase efficiency and use of amino acids in feed which has resulted in a more balanced feed which reduces the need to add protein feed in a feed mixture for pigs.

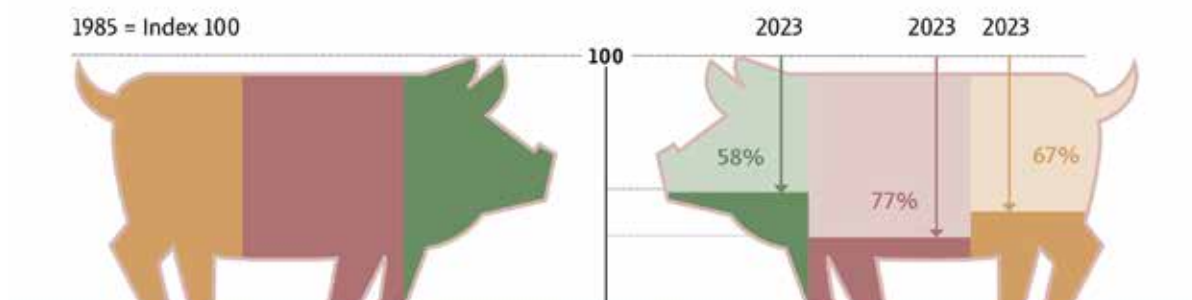
- Breeding programs have increased the pigs' efficiency in feed utilization, growth and number of piglets by each sow¹. Over the last 20 years, a Danish pig eats 17 kg less feed to achieve the same growth, this corresponds to a reduction approx 15-20 percent lower units ammonia emission per pig².
- Adding amino acids to feed leads to a better uptake of protein by the pig. This gives the farmer the opportunity to add less protein to the feed, which in collaboration leads to less ammonium nitrogen excreted from the urine. This optimizes growth and reduces the ammonia emissions from production. This means that a finishing pig today has approx. 45 percent lower ammonia loss than if the same pig was given a typical feed mixture from the late 1980s.

Additionally, adding the enzyme phytase the emissions of phosphorous per pig have been halved over the last 30 years³.

In combination, these measures have resulted in reductions of nitrogen by 58%, reductions of ammonia by 77% and reduction of phosphorous by 67% from 1985 – 2023, and the work continues to gain further reduction.

Emissions per kg pig meat 1985-2023

■ Nitrogen ex animal ■ Ammonia, housing and store ■ Phosphorous ex animal



Reference: DCE, Albrektzen et al. (2025), Pigmeat statistics 2010-2023, L&F and reference: [DenmarkNFRReport2025.xlsx \(europa.eu\)](#)

¹ Kilde: Landsgennemsnit for produktivitet i produktionen af grise, SEGES Innovation

² Bæredygtighed og klima i landbruget, svineproduktion.dk/aktuelt/temaer/baeredygtighed

³ Bæredygtighed og klima i landbruget, svineproduktion.dk/aktuelt/temaer/baeredygtighed