LESS AMMONIA, GREATER VALUE FROM MANURE?

Bacterial xylanase, from pig nutrition to anaerobic digestion.

Sustainable feeding | Improved air quality | Better manure valorization

1 An adapted feeding strategy

Reduced protein and energy diets with bacterial xylanase (100 g/t)



	CP (%)	Net energy (kcal/kg)
C+ (positive control)	16.3	2,476
C– (negative control)	14.9	2,426
C–Xyl	14.9 + xylanase (100 g/t)	2,426

2 Healthy pigs



Similar growth performance across diets.

Numerically higher weight gain with C–Xyl.

3 Concrete results at the farm level

AMMONIA EMISSIONS (NH_3)

NH_3 ↓ **-21 %**

C–Xyl vs C–

5.34 vs 6.77 g/kg gain
(P = 0,016)

TOTAL N EXCRETION

N ↓ **-18 %**

C–Xyl vs C+

22.9 vs 28.0 g N/kg gain
(P = 0,013)

No significant difference between C– and C–Xyl.

4 A modified manure



Modified manure nitrogen composition through the feeding strategy.

5 Promising energy recovery

ANAEROBIC DIGESTION OF MANURE



Specific methane yield (AUC)

Ammoniacal nitrogen in digestate (AUC)

H_2S in biogas (AUC)

6 Environmental impacts (LCA)

C–Xyl vs C–
(kg gain · EF 3.1)

Climate change ↓ **-3 %**

Acidification ↓ **-11 %**

Particulate matter formation ↓ **-11 %**

LCA: manure storage included; field emissions and methanization excluded. EF 3.1 method.

Key message

A feeding strategy with reduced protein and energy levels, supplemented with xylanase, **reduces nitrogen excretion** compared to C+, while bacterial xylanase decreases **ammonia emissions** compared to C–, with **similar growth performance**.

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Data from two complementary studies conducted in growing pigs (2025).