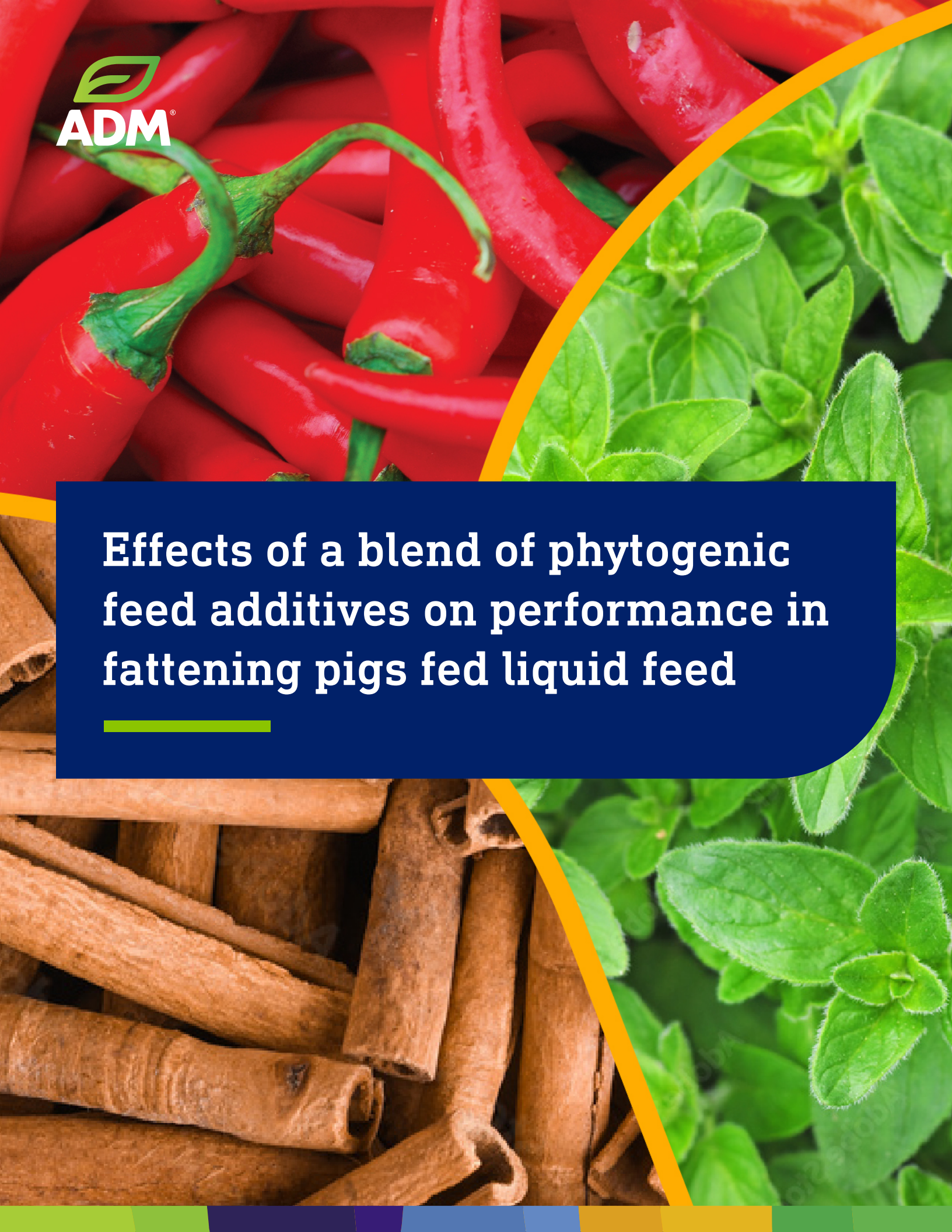


Effects of a blend of phytogenic feed additives on performance in fattening pigs fed liquid feed

Objective of the trial:

Assess the effect of supplementing a standardized blend of cinnamaldehyde, capsicum oleoresin and carvacrol on growth performance and carcass grading in fattening pigs fed low nutritional value liquid diets (-0.2 MJ (-50kcal) NE/kg and -0.02% SID Lys).

Materials and methods

Location: CRZA Research Farm, France

Animals & housing:
270, 68-days-old pigs (ADENIA x Piétrain) initially weighing 32.1 kg

45 pens (L: 3.85 m, l: 1.55 m = 5.97 m²)
of 6 pigs each (mix of barrows and females)

Feeding strategy:
Liquid feed (dilution: 2.8 L water/kg of feed)

Feed restriction applied all through the experimental period:

40g of feed/kg BW at d0, then a progression of 27g/d with a maximum of 2.65kg/d.

Bi-phase strategy:

Grower Phase	Finisher Phase
day 68 - day 103	day 103 - slaughter

Experimental design:
3 experimental treatments compared over the whole fattening period:

Negative control (NC) — Low but no deficient levels of energy and digestible amino acids.

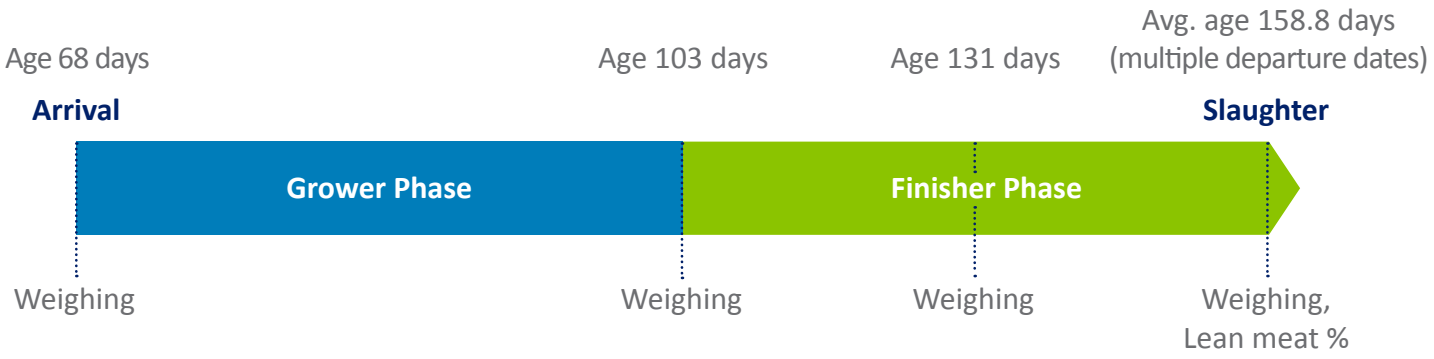
Negative control + Plant extract (NC+PE) — NC diet + 80g/T of phytogenic feed additives (2% Capsicum oleoresin, 3% Cinnamaldehyde, 5% Carvacrol).

Positive control (PC) — Higher NE value (+50 kcal= +0.2 MJ vs. NC feeds) - same CP level and SID lysine/NE ratios.

	Growing (d68-d103)			Finishing (d103-Slaughter)		
Description	NC	NC+PE	PC	NC	NC+PE	PC
PE	0	80 g/T	0	0	80 g/T	0
NE MJ/kg	9.6	9.6	9.8	9.7	9.7	9.9
NE, kcal/kg	2293	2293	2341	2317	2317	2365
CP, %	15.0	15.0	15.2	14.1	14.1	14.2
Lys SID, %	0.84	0.84	0.86	0.78	0.78	0.80
SID Lys/ NE, g/MJ	0.88	0.88	0.88	0.80	0.80	0.81

Material and methods

Parameters measured:
Feed intake: daily recording per pen.

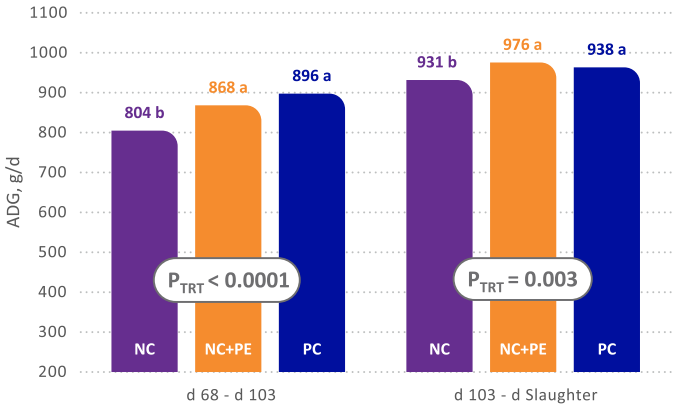


Calculations:
Average Daily Feed Intake (ADFI), Average Daily Gain (ADG) and Feed Conversion Ratio (FCR) were calculated based on data recorded during the trial. Dressing percentage was calculated as the slaughter weight divided by the carcass weight.

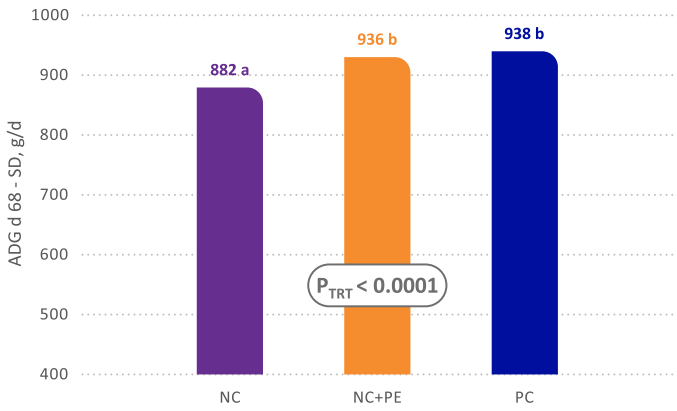
Statistical analysis:
- The experimental unit was the pen for all the variables.
- Anova: Y = μ + TRT + Room + BWd68 + Error - Interactions removed as non-significant
- Variables expressed as % transformed by applying arcsine function

Results: Growth

During both growing and finishing periods, pigs fed PE realized:
- Significantly higher ADG compared to the NC group
- Comparable ADG compared to the PC group



Over the entire fattening period, pigs fed PE realized:
- Significantly higher ADG compared to the NC group: +6.1%
- Comparable ADG compared to the PC group



Results: Feed efficiency

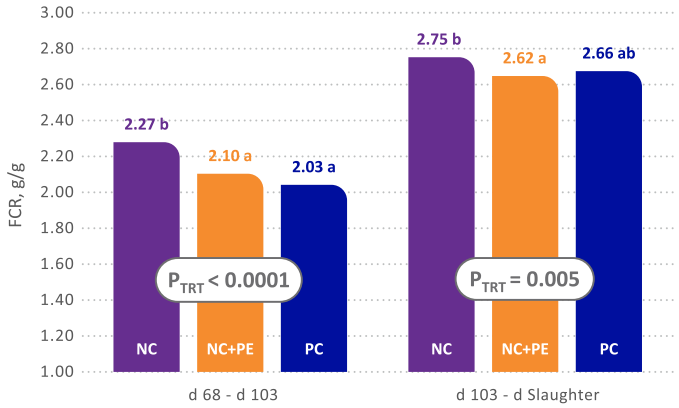
During both growing and finishing periods, pigs fed PE had:

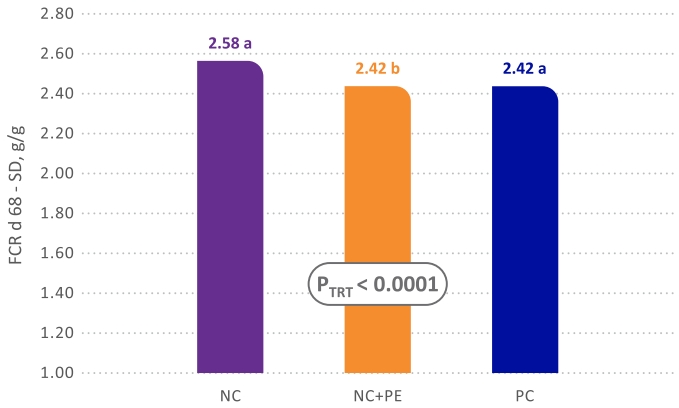
- Significantly lower FCR compared to the NC group
- Comparable FCR compared to the PC group

➔Same hierarchy and magnitude of differences as ADG due to feed restriction

Over the entire fattening period, pigs fed PE had:

- Significantly lower FCR compared to the NC group: -6.2%
- Comparable ADG compared to the PC group





Results: Carcass grading

Carcass weight and age at slaughter

- Pigs fed NC were slaughtered numerically later when compared with others (+ 2.5d, P=NS)
- No significant difference in terms of carcass weight – but NC carcasses were numerically lighter

Lean Meat percentage

- All 3 groups are within French carcass valorization standards (TMP).
- LM content from PC pigs was lower than the one from NC pigs. LM content was intermediate for the pigs fed PE
- Need to consider that PC and NC+PE pigs were heavier at slaughter day ➔ a potential bias!

BW at slaughter day added as covariable in the model but same observation.

When considering this present study, results may confirm the relevance of the NE equivalence previously proposed, i.e. +30 kcal/kg of NE for 80 ppm of plant extract.