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Rapeseed meal utilization, as an alternative to soybean meal incorporation in pig diets, in association with a concomitant reduction of the dietary crude protein (CP) content was evaluated in growing-finishing pigs. On the one hand, growth performance were characterised when soybean meal was replaced by rapeseed meal in association with grade amino acids that included L-Valine or not. On the second hand, N and P output were simulated using the InraPorc software.

## Material and methods

- 140 group-housed growing-finishing pigs, fed ad libitum
- 3 treatments (Tables 1 and 2)

**Table 1: Specific feedstuffs used, crude protein and standardised ileal digestible (SID) lysine levels**

Treatments	S	RM <sup>1</sup>	RM+V <sup>1</sup>
Soybean meal	x	(x)	(x)
Rapeseed meal		x	x
L-Lysine	x	x	x
L-Threonine	x	x	x
DL-Methionine	x	x	x
L-Tryptophane		x	x
L-Valine			x
Crude protein, % <sup>2</sup>	15.9 / 15.0	15.0 / 14.1	14.5 / 13.2
SID Lysine, g/kg <sup>2</sup>	8.3 / 7.3	8.3 / 7.3	8.3 / 7.3

1. Soybean meal incorporation rate was as small as possible.

2. Both values correspond to growing and finishing periods, respectively.

- Diets formulated on the same net energy basis : 9.7 MJ NE/ kg
- Measurements: Growth performance and carcass characteristics
- Simulations: N and P output using InraPorc software

**Table 2: Minimum ratio between the SID lysine and other essential amino acids**

Amino acid	Lysine
Threonine	65 %
Methionine	30 %
Methionine + Cystine	60 %
Tryptophane	20 %
Valine	70 %
Isoleucine	55 %
Leucine	100 %
Histidine	32 %



## Results

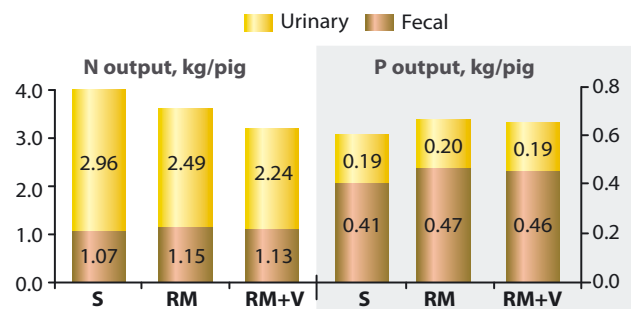
- No significant difference between the 3 treatments on growth performance or carcass characteristics (Table 3).
- The estimated N retention was similar in the 3 treatments.
- Taking into account the lower CP content in diets RM and RM+V, N output was reduced by 10 and 16% with these feeding strategies, when compared to the S one (Figure 1).

- P intake was higher with RM and RM+V diets (+0.07 and +0.05 kg/pig, respectively), and extra P intake was excreted almost completely in faeces (Figure 1).

**Table 3: Performance between 27 and 111 kg BW**

Treatment	S	RM	RM+V	Stat <sup>1</sup>
Feed intake, kg/d	2.34	2.38	2.33	ns
Average daily gain, g/d	801	801	818	ns
Feed conversion ratio	2.94	2.97	2.87	ns
Carcass leanness, %	61.3	60.9	61.8	ns

<sup>1</sup> Variance analysis with the treatment (stat. presented), the gender, the interaction between both factors, and the replicate as main effects (proc GLM, SAS).



**Figure 1: Simulated excretory patterns of N and P**

## Discussion - Conclusion

The current trial was performed with diets designed on the same NE basis, and ratio between amino acids were in agreement with the ideal protein concept. In such conditions, our results demonstrate the possibility to reduce the dietary CP content and to replace soybean meal by rapeseed meal and crystalline amino acids (L-Lysine, DL-Methionine, L-Threonine, L-Tryptophane, L-Valine) simultaneously without any consequence on growth performance and carcass value. Subsequently, N output was considerably reduced. However, at the same time, rapeseed meal incorporation was associated with higher P output, but to a lower extend when L-Valine is also used to decrease further the dietary CP content, i.e. the incorporation rate of protein sources.

Total removal of soybean meal during the growing phase may be possible with diets formulated on a lower NE basis or with another protein rich feedstuff, such as peas or horse bean, in association with rapeseed meal and crystalline amino acids.