Assessment of the methionine requirement of pigs in the weight range 11 to 23kg

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Conclusions and Implications

- DL-Methionine supplementation significantly improved piglet performance.
- Based on exponential regression analysis, the methionine requirement for obtaining maximum weight gain and feed efficiency was calculated to be 0.41 and 0.37 %, respectively.
- The optimum ratio of dietary Methionine : Lysine was 33 : 100.

Introduction and Objectives

Methionine has not been researched as thoroughly as other amino acids. Many pork producers are increasingly using protein sources such as peas and lentils, which are lower in methionine than traditional protein sources. Moreover, in response to decreasing costs associated with the use of crystalline amino acids and the need to formulate rations with minimal nitrogen concentrations, the necessity to establish requirements for specific amino acids becomes apparent.

An experiment was conducted to establish the methionine requirements for 11 – 23 kg pigs.

Experimental design

The experiment was conducted as a complete randomized block. 192 pigs, with an initial body weight of 11.5 kg were randomly distributed among 7 treatments for an experimental period of 24 days. Pigs were housed in groups of 2 pigs per pen with completely slatted floors and had free access to water and feed.

DL-methionine was added on top of the basal diet (0.22 % methionine) at 0.04 % increments to create the remaining 6 diets.

The ingredient and nutrient composition of the basal diet is given in Table 1.

Table 1: Ingredient, energy and nutrient composition of the basal diet (%)

Ingredients	%	Energy and Nutrient content	%
Wheat	23.1	DE, MJ/kg	14.9
Barley	15.0	NE, MJ/kg	9.4
Soya Full Fat	20.0	Crude protein, %	16.6
Peas	24.0	Calcium, %	0.70
Corn Starch	12.0	Phosphorus, %	0.54
Soybean oil	2.5	**Amino acid content**	**%**
L-Lysine·HCl	0.35	Lysine	1.20
L-Threonine	0.20	Threonine	0.79
L-Tryptophan	0.05	Methionine	0.22
L- Valine	0.05	Met+Cys	0.49
L-Isoleucine	0.05	Tryptophan	0.24
Dicalcium phosphate	1.10	Isoleucine	0.72
Calcium carbonate	1.00	Valine	0.81
NaCl	0.30		
Mineral + vitamin supplement	0.30		

Results

Pig performance is shown in Table 2. There was a highly significant linear and quadratic response to methionine level in the diet for weight gain and feed conversion ratio.

Table 2: Pig performance results

	Dietary methionine content (%)									
	0.22	**0.26**	**0.30**	**0.34**	**0.38**	**0.42**	**0.46**	**s.e.**	**Linear**	**Quadratic**
Pig weights										
Initial BW, kg	11.3	11.4	11.4	11.3	11.3	11.8	11.8	0.18	5 *	15
Final BW, kg	18.6	20.4	22.3	22.5	23.6	23.8	22.5	0.43	< 1 **	< 1 **
Pig performance										
Daily gain, g	297	372	453	457	507	515	459	18	< 1 **	< 1 **
Daily feed, g	748	734	775	840	775	829	707	31	70	1 *
FCE	2.55	2.00	1.74	1.75	1.54	1.60	1.55	0.09	< 1 **	< 1 **

* = P < 0.05; ** = P < 0.01

The methionine requirement was estimated from weight gain and feed to gain data using a non-linear regression procedure. Exponential response curves were fitted to the experimental data points.

Daily weight gain (Figure 1) improved significantly with increases in dietary methionine up to a dietary level of 0.41 %. Improvements in feed efficiency (Figure 2) were observed up to dietary level of 0.37 %.

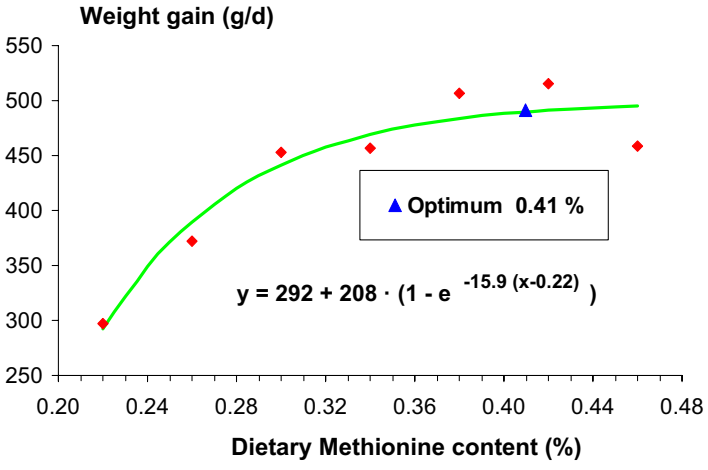

Figure 1: Weight gain of piglets fed increasing levels of DL-Methionine (11-35d after weaning)

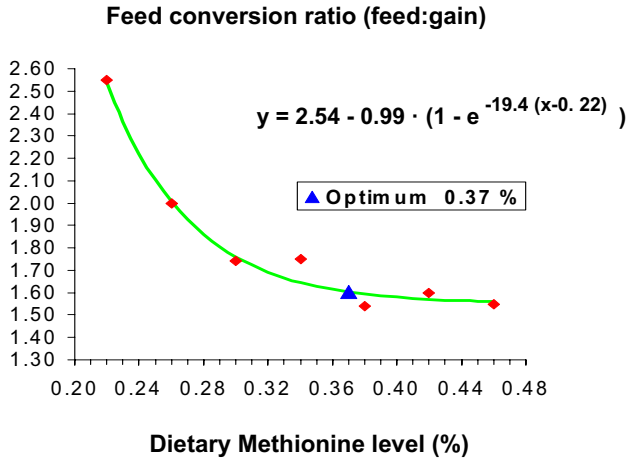

Figure 2: Feed conversion ratio of piglets fed increasing levels of DL-Methionine (11-35d after weaning)