

THE UTILIZATION OF LYSINE IN COTTONSEED MEAL AND MEAT MEAL BY PIGS

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There is uncertainty about the utilization of both free lysine and of lysine in protein supplements (Batterham 1979). Values range from 0.35 for cottonseed meal to 0.90 for soybean meal. The object of the experiment presented here was to determine whether large differences in the availability of lysine in protein supplements exist such that production performance of pigs is influenced.

Six pigs were grown from 20 to 40 kg liveweight (W) on each of 5 diets (Table 1) supplemented with minerals, vitamins and Cr_2O_3 . Pigs were housed in a pig unit (22 + 30C) and fed individually, once daily, using the formula: feed (g/d) = $120 W^{0.75}$. Utilization of lysine was calculated using data of Batterham (1979), and for the grain mixture, a value of 0.85 was used. The results are also shown in Table 1.

TABLE 1 Diet composition (g/kg), determined chemical analyses (g/kg) (as is basis) and results of the growth trial.

Diet	1	2	3	4	5
Grain mix (13% CP)	600	600	600	600	600
Soybean meal (47% CP)	150	150			75
Meat meal (50% CP)			71	86	71
Cottonseed meal (42% CP)			83	103	83
Sugar and starch	195	192	204	167	135
Tallow and oil	20	20	32	36	26
L-lysine monohydrochloride		2.8			
Crude protein	148	146	138	158	175
Dig. crude protein	111 ^{a*}	115 ^a	98 ^b	133 ^c	137 ^d
Lysine calc.	6.8	8.6	6.3	7.1	8.4
found	7.0	8.2	7.3	7.5	8.8
available	6.0	8.2(7.1) [†]	3.7	4.1	5.7
DE (MJ/kg)	13.5 ^a	13.8 ^{ac}	13.6 ^a	14.6 ^b	13.9 ^c
Gain (g/d)	645 ^{ac}	750 ^b	626 ^a	642 ^a	709 ^{bc}
FCR	2.2 ^a	1.9 ^b	2.3 ^a	2.2 ^a	2.0 ^b

* Values with different superscripts (a-c) are significantly different ($P < 0.05$)

† Assumes free lysine to be 50% available

Diets 2 and 5 gave the highest growth rate and lowest FCR, these were generally different ($P < 0.05$) from diets 1, 3 and 4. The only difference in composition between diets 1 and 2 was the addition of free lysine to diet 2. The large response would suggest that it is well utilized even when diets are offered once daily. Batterham (1979) showed that under such a feeding regime utilization was about 50%. Differences in DE between some diets did not appear to influence interpretation of results. The very low values calculated for available lysine for most diets was not supported by growth rates and FCR particularly on diet 5. Although Batterham's (1979) coefficients for lysine utilization may allow correct ranking of protein supplements, it appears that the coefficients for cottonseed meal (0.35) and meat meal (0.50) are too low.

BATTERHAM, E.S. (1979). In "Recent Advances in Animal Nutrition 1979", p.11, editors W. Haresign and D. Lewis (Butterworths: London)..

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