Nitrogen was determined in duplicate (urine and faeces) and triplicate (diets) with fresh samples of 1 ml, 0.6 g and 2 g respectively. Digestion, with selenium as catalyst, was continued for 30 min after clearing.

Standard analyses of variance were made on data from each collection period, and the three collection periods combined.

III. RESULTS

All pigs appeared healthy throughout both trials.

Nitrogen retention and dry matter digestibility in Experiments 1 and 2 and results from Jones and Cadenhead (1965) and Cole, Duckworth and Holmes (1967) are presented in Table 1.

TABLE 1

Percentage dietary nitrogen retention (N), percentage dry matter digestibility (DM), and litres of urine output (U) for Experiments 1 and 2, and data presented by Jones and Cadenhead (1965) and Cole, Duckworth and Holmes (1967)

Experiment		No. of Animals per diet	Diets 1	2	3	4	5	Overall treatment difference Significance	Coefficient of Variation (C.V.)
No. 1									
N—Period	1	3	33.7	41.3	31.8	41.4		*	7.2
	2	3	29.0	42.7	37.0	44.0		*	20.2
	3	3	35.8	39.9	32.8	40.1		*	10.9
	Mean		32.8	41.3	33.9	41.8		*	14.0
DM—Period	1	3	84.7	85.5	84.3	84.7		NS	2.3
	2	3	85.3	85.4	86.0	85.8		NS	1.9
	3	3	85.6	84.0	84.1	84.8		NS	2.7
	Mean		85.2	85.0	84.8	85.1		NS	2.3
U—Period	1	3	Mean	10.8	Range	2.6-42.1			
	2	3		19.5		2.9-71.5			
	3	3		21.2		3.0-72.4			
No. 2									
N—Period	1	3	34.2	36.5	36.9	33.7		NS	9.2
	2	3	35.4	31.0	25.9	32.3		*	7.9
	3	3	35.6	34.4	35.0	36.2		NS	8.2
	Mean		35.1	34.0	32.7	34.2		NS	8.5
DM—Period	1	3	82.3	80.4	82.0	79.0		NS	1.6
	2	3	82.2	78.3	81.8	78.8		*	1.4
	3	3	82.3	79.8	82.8	80.4		*	0.6
	Mean		82.3	79.5	82.3	79.5		*	1.2
U—Period	1	3	Mean	5.8	Range	1.8-10.9			
	2	3		8.2		2.3-14.4			
	3	3		9.0		2.5-13.9			
Jones and Cadenhead (1965)									
N		6	41.1	44.9	46.0	27.2	37.2	***	8.1‡
DM		6	86.7	87.3	85.7	81.7	81.3	*	6.4‡
Cole, Duckworth and Holmes (1967)									
N†		8	14.3	20.1	15.0	20.9		NS	49.9‡
DM		8	78.3	77.3	75.1	64.7		***	2.5‡

*$P<0.05$

***$P<0.001$

†N retention, g/day.

‡C.V. calculated from data presented

estimation of small treatment effects. The selection of pigs on a litter-mate basis and not on adaptability to cages may have placed some animals under a greater stress than others, so affecting nitrogen metabolism and resulting in variation between animals.

Incomplete separation of urine and faecal nitrogen in Experiments 1 and 2 made it invalid to calculate apparent nitrogen digestibility and nitrogen retention. Such knowledge would be essential if a fuller understanding of factors affecting nitrogen balance was to be gained. However, it is possible that the errors associated with these measurements are similar in magnitude to those of nitrogen balance.

The variation in measurements of nitrogen balance under our conditions, and in the work of others, indicates that, unlike the determination of dry matter digestibility, the technique is only useful when large treatment differences are likely to be encountered. The number of replicates required and labour involved in detecting smaller differences restricts its usefulness.

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