

COMPOSITION OF PIG DIETS AS AFFECTING WASTE COMPOSITION AND UTILIZATION

G. R. PEARCE* and E.P. HILLIARD*

The most common method of utilizing piggery waste is by application to land but considerable experimental investigation has been directed towards methane gas production, single cell protein production and the inclusion of waste into diets of ruminants. Insufficient attention has been given to the variability in the composition of waste from different sources as affected by the dietary formulations adopted by different piggery operators.

In a survey of 24 commercial piggeries in the Bendigo/Shepparton area of Victoria, samples of fresh, uncontaminated pig faeces showed variations in chemical composition as in Table 1.

TABLE 1: Means and ranges in composition of faeces samples from 24 piggeries in Victoria (dry matter basis).

Component	Mean	Range	Component	Mean	Range
Crude protein %	19	11-31	Phosphorus %	2.6	1.4- 4.6
Crude fibre %	18	7-23	Calcium %	3.5	1.5- 8.5
Ash %	17	10-28	Potassium %	1.0	0.6- 1.6
Gross energy kJ/g	18	16-20	Iron mg/kg	2169	971 -6407
Neutral detergent fibre %	45	20-60	Zinc mg/kg	600	225 -1059
Lignin %	5	3- 6	Copper mg/kg	280	27 - 822

The mean in vitro organic matter digestibility was 35% with a range of 21 to 69%. Thus it would be expected that widely varying degrees of utilization would occur when piggery waste from different sources is (a) included in diets fed to ruminants and (b) used as a substrate for methane production in anaerobic digesters.

Application rates of wastes to land are sometimes calculated on the basis of supplying a maximum of 500 kg N/ha/annum. From the present data it can be calculated that approximately 46 tonnes of raw, wet manure would supply 500 kg N in the waste with the highest nitrogen concentration while 121 tonnes of manure could be safely applied in the case of the lowest nitrogen concentration. Therefore it would be quite inappropriate for an operator to adopt an "average" loading rate or to adopt a loading rate that another operator had found to be safe under different conditions. Furthermore, widely varying amounts of other elements (including heavy metals) will be applied with manure containing 500 kg N from different sources.

The variability in the composition of piggery waste from different sources is due mainly to the composition of the pigs' diets. Nitrogen concentrations in diets of the 24 piggeries surveyed ranged from 2.0 to 3.3% and all other components showed a similar wide range.

* School of Agriculture and Forestry, University of Melbourne, Parkville, Victoria, 3052.