

Table 10-10. Estimated N and P excretion in per pig place and per pig finished.

	Nitrogen	Phosphorus	Units
Results per pig place			
Farrow to wean	35.1	11.7	lbs/yr
Wean to finish	24.5	5.1	lbs/yr
Results per pig finished			
Farrow to wean	2.0	0.6	lbs/pig
Wean to finish	12.8	2.7	lbs/pig
Farrow to finish	14.8	3.3	lbs/pig

Excretion figures may vary substantially from farm to farm. For example, one farm had a calculated P excretion during the wean-to-finish phase of 2.9 lbs/pigplace/year (instead of 5.1). This value is substantially lower than the value reported in the table above and was considered atypical, but it does illustrate that generalizing the above figures can be problematic.

Note 1: The above data were obtained from major swine integrators and represent a substantial portion of the U.S. industry. However, they may not necessarily be representative of the U.S. swine industry as a whole (e.g., small home-mixing farms will likely have higher excretion figures).

Note 2: These data are based on formulated values for feed composition, rather than actual values. It is expected that feeds typically contain more P than what the formulation called for, but the magnitude of this difference is not known.

Economics of Reducing Nitrogen and Phosphorus Excretion

Figures for the excretion of N and P vary widely in literature. This is partially caused by estimates that are based on figures of little relevance to modern American swine production. To get reliable figures, swine nutritionists from major swine-producing companies were approached. The results from this inquiry are provided in Table 10-10.

For N, data were derived from a survey performed among five of the major swine integrators. Data on feed consumption and composition as well as meat produced and mortality were collected. Because mortality is typically processed into animal feed and other products, N removed through this route was not considered as waste.

For P, data were derived from two different sources. For the farrow-to-wean phase, data were obtained from a major integrator. This integrator also supplied data for the wean-to-finish phase, but these data were considered atypical. Instead, data were obtained from a nutritionist who formulates feeds for several major swine producers and thus was qualified to provide data.

The data are presented in two formats: per pig place per year and per pig finished. For the farrow-to-wean phase, results are considered on a per sow basis. Results per pig finished relates to finisher pigs marketed (thus not weanling pigs or sows slaughtered).

The nursery and grower-finisher phase were combined, because the data obtained were in this format. It is estimated that 11% of P and 8% of N excretion occurs during the nursery phase; the remainder is excreted during the grower-finisher phase.

The impact that the outlined strategies to reduce nutrient excretion have on waste production depends heavily on the extent to which they are adapted by the livestock producers, which itself depends on the disposal costs of waste, and thus, the incentive for livestock producers to reduce waste. Even with low disposal costs, P excretion can probably be reduced by 30% to 50% through nutritional means. A major part of this reduction can be achieved through the

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use of phytase. Adding phytase to a diet at 500 units/kg costs approximately \$2.20 per ton of feed for a mash diet (for pelleted diets, the cost is higher because a post-pelleting application system is required). However, phytase replaces inorganic P as well as a small portion of the protein. The increase in feed cost required to reduce P excretion in the range proposed is expected to be less than 1%. In practical terms, P excretion may be reduced by 1.3 lbs per pig finished (or 40%) for an investment of \$0.36 to \$0.72 in extra feed cost per pig finished (for a farrow-to-finish operation).

...N excretion may be reduced by 3 lbs per pig finished (or 20%) for an investment of \$1.80 to \$3.60 in extra feed cost per pig finished (for a farrow-to-finish operation).