

Table S1. Inorganic phosphorus concentrations for manure types collected within this study.

Waste Type	n	DRP (mg/L)
Dairy	2	1.42
Dairy	2	2.17
Poultry	3	8.88
Poultry	3	33.35
Poultry	3	26.50
Swine	2	7.05
Swine	2	4.00

Table S2. $\delta^{18}\text{O}_{\text{PO}_4}$ ratios from this study only. Percent oxygen recovered in each Ag_3PO_4 sample is also detailed.

Waste Type	Location	Sample	$\delta^{18}\text{O}_{\text{PO}_4}$ (‰)	%O
Poultry	4	A	14.28	17.9
Poultry	4	B	14.79	13.3
Poultry	4	C	14.53	12.9
Poultry	1	A	17.56	11.2
Poultry	1	B	17.94	18.1
Poultry	1	C	18.57	9.2

Poultry	2	A	19.23	8.9
Poultry	2	B	19.11	16.2
Poultry	2	C	18.91	14.5
Poultry	3	A	18.19	16.4
Poultry	3	B	18.71	15.9
Poultry	3	C	18.02	19
Swine	1	A	18.76	12.5
Swine	1	B	18	11.7
Swine	1	C	18.68	14.5
Swine	2	A	17.75	12.9
Swine	2	B	17.22	16.7
Swine	2	C	17.01	13.5
Dairy	1	A	17.19	18
Dairy	1	B	17.03	15.6
Dairy	1	C	16.34	15.5
Dairy	2	A	15.59	10.1
Dairy	2	B	16.77	12.2

Table S3. $\delta^{18}\text{O}_{\text{PO}_4}$ ratios and n values for waste samples within this study as well as from previous literature.

Waste Type	n	$\delta^{18}\text{O}_{\text{PO}_4}$ (‰)	Citation
Dairy	4	17.1	Marshall and McCluney Unpublished Data

Dairy	4	17.6	Marshall and McCluney Unpublished Data
Dairy	4	16.9	This Study
Dairy	4	16.18	This Study
Poultry	6	16.6	Marshall and McCluney Unpublished Data
Poultry	6	16.3	Marshall and McCluney Unpublished Data
Poultry	6	16.8	Marshall and McCluney Unpublished Data
Poultry	6	18.0	This Study
Poultry	6	19.1	This Study
Poultry	6	18.3	This Study
Septic	4	13.7	Tonderski et al., 2017
Septic	4	16.2	Tonderski et al., 2017
Septic	4	13.2	Tonderski et al., 2017
Septic	4	14.5	Tonderski et al., 2017
Swine	5	15.7	Marshall and McCluney Unpublished Data
Swine	5	14.3	Marshall and McCluney Unpublished Data
Swine	5	15.1	Marshall and McCluney Unpublished Data
Swine	5	18.5	This Study
Swine	5	17.3	This Study
Wastewater	46	11.1	Gooddy et al., 2018
Wastewater	46	8.7	Gooddy et al., 2018
Wastewater	46	10.9	Gooddy et al., 2018
Wastewater	46	15.1	Gooddy et al., 2018
Wastewater	46	14.2	Gooddy et al., 2018
Wastewater	46	11.6	Gooddy et al., 2018
Wastewater	46	11.4	Gooddy et al., 2018
Wastewater	46	12.9	Gooddy et al., 2018

Wastewater	46	15.8	Gooddy et al., 2018
Wastewater	46	9.4	Gooddy et al., 2018
Wastewater	46	14.1	Gooddy et al., 2018
Wastewater	46	11.5	Gooddy et al., 2018
Wastewater	46	14.3	Gooddy et al., 2018
Wastewater	46	14.5	Gooddy et al., 2018
Wastewater	46	14	Gooddy et al., 2018
Wastewater	46	11.5	Gooddy et al., 2018
Wastewater	46	15.8	Davies 2016
Wastewater	46	14.7	Gooddy et al., 2016
Wastewater	46	16.2	Gooddy et al., 2016
Wastewater	46	16.2	Davies 2016
Wastewater	46	16.1	Davies 2016
Wastewater	46	19.7	Granger et al., 2017
Wastewater	46	19.6	Granger et al., 2017
Wastewater	46	18.2	Granger et al., 2017
Wastewater	46	16.4	Granger et al., 2017
Wastewater	46	16.9	Granger et al., 2017
Wastewater	46	16.9	Granger et al., 2017
Wastewater	46	9.1	Young et al., 2009
Wastewater	46	12.3	Young et al., 2009
Wastewater	46	8.4	Mclaughlin et al., 2006
Wastewater	46	11.1	Mclaughlin et al., 2006
Wastewater	46	8.4	Young et al., 2009
Wastewater	46	11.1	Young et al., 2009
Wastewater	46	8.7	Young et al., 2009

Wastewater	46	9	Young et al., 2009
Wastewater	46	13.6	Young et al., 2009
Wastewater	46	18.4	Gruau et al., 2005
Wastewater	46	16.6	Gruau et al., 2005
Wastewater	46	17.7	Gruau et al., 2005
Wastewater	46	18	Gruau et al., 2005
Wastewater	46	17.6	Gruau et al., 2005
Wastewater	46	15.2	Marshall and McCluney Unpublished Data
Wastewater	46	16.2	Marshall and McCluney Unpublished Data
Wastewater	46	16.2	Marshall and McCluney Unpublished Data
Wastewater	46	17.6	Marshall and McCluney Unpublished Data
Wastewater	46	17.1	Marshall and McCluney Unpublished Data
Seabird	10	20.7	Ayliffe et al., 1992
Seabird	10	20.8	Ayliffe et al., 1992
Seabird	10	20.5	Ayliffe et al., 1992
Seabird	10	20.3	Ayliffe et al., 1992
Seabird	10	20.2	Ayliffe et al., 1992
Seabird	10	20.2	Ayliffe et al., 1992
Seabird	10	20.3	Ayliffe et al., 1992
Seabird	10	19.8	Ayliffe et al., 1992
Seabird	10	20.8	Ayliffe et al., 1992
Seabird	10	23.1	Ayliffe et al., 1992
Dog	1	15.7	Young et al., 2009
Goose	1	18.3	Young et al., 2009