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Swine Manure Management

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Water Quality Information Center

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SWINE MANURE MANAGEMENT

1. Abstractions and runoff from fescue plots receiving poultry litter and swine manure.
Edwards, D. R.; Daniel, T. C.

Trans-A-S-A-E v.36, p.405-411. (1993).
Includes references.
Descriptor: festuca-arundinacea; pig-manure; poultry-manure; application-rates; hydrology-; infiltration-; rain-; runoff-; arkansas-
Abstract: This study was conducted to assess the effects of animal manure application rate (218 vs. 435 kg nitrogen/ha), rainfall intensity (50 vs. 100 mm/h), and interactions on initial abstraction, runoff, total abstraction, and curve number for a simulated storm occurring one day after application to plots

covered with "tall" fescue. Manure application rate had no significant effects on the hydrologic parameters. The data were then averaged across manure application rates and incorporated with control plot data to determine the effects of manure treatment (control, poultry litter, and swine manure), rainfall intensity, and interaction on the four hydrologic parameters. No differences in mean hydrologic parameter values between the control and litter-treated plots were detected initial and total abstractions for the swine manure-treated plots were only approximately 50% of those observed from the control and poultry litter-treated plots. Runoff from the swine manure-treated plots was three times that observed for the control and poultry litter-treated plots at the 50 mm/h rainfall intensity. Curve number for the plots receiving swine manure was 15% greater than that for the control and poultry litter-treated plots. The short-term differences in hydrologic characteristics of the swine manure-treated plots may be attributed to the addition of water via the liquid manure and to soil surface sealing by fine manure particles. Additional work was performed to determine whether the application of the manures affected the hydrologic parameters for longer (4 to 14 days) drying intervals between application and first simulated storm. The results indicated that when the manures were applied at 218 kg nitrogen/ha, hydrologic parameters for the manure-treated plots were no different from those for untreated plots for drying intervals of four days or greater.

NAL Call No.: 290.9-AM32T

2. Aerated swine-wastewater treatment with K-carrageenan-immobilized *Spirulina maxima*.
Canizares, R. O.; Rivas, L.; Montes, C.; Dominguez, A. R.; Travieso, L.; Benitez, F.

Bioresour-technol. Barking, Essex, England : Elsevier Applied Science ; New York, NY : Elsevier Science Publishing Co., 1991-. 1994. v. 47 (1) p. 89-91.

Includes references.

Descriptor: pig-farming; waste-water-treatment; aeration-; spirulina-; immobilization-

NAL Call No.: TD930.A32

3. Aeration experiments for swine waste composting.
Lau, A. K.; Lo, K. V.; Liao, P. H.; Yu, J. C.

Bioresource-Technol v.41, p.145-152. (1992).

Includes references.

Descriptor: pig-manure; waste-treatment; composting-; aeration-; temperature-; composts-; physicochemical-properties

NAL Call No.: TD930.A32

4. Agronomically efficient and environmentally careful slurry application to arable crops.
Lorenz, F.; Steffens, G.

Asp-appl-biol p.109-116. (1992).

In the series analytic: Nitrate and farming systems / edited by J.R. Archer, K.W.T. Goulding, S.C. Jarvis, C.M. Knott, I. Lord,

S.E. Ogilvy, J. Orson, K.A. Smith, and B. Wilson.
Descriptor: beta-vulgaris-var; -saccharifera; zea-mays;
solanum-tuberosum; secale-cereale; triticum-aestivum; pig-slurry;
ammonium-sulfate; ammonium-nitrate; application-rates;
crop-yield; soil-fertility; nitrogen-; leaching-; lower-saxony
NAL Call No.: QH301.A76

5. Ammonia volatilization during storage of cattle and pig
slurry: effect of surface cover.
Sommer, S. G.; Christensen, B. T.; Nielsen, N. E.; Schjorring, J.
K.

J-Agric-Sci v.121, p.63-71. (1993).
Includes references.

Descriptor: cattle-slurry; pig-slurry; storage-; volatilization-;
wind-tunnels; air-pollution; ammonia-; denmark-
NAL Call No.: 10-J822

6. Ammonia volatilization from cattle and pig slurry during
storage and after application in the field. Ammoniakfordampning
fra kvaeg- og svinegyfle under lagring og efter udbringning pa
jorden.
Sommer, S. G.

[Kobenhavn?] : Landbrugsministeriet, Statens planteavlfsforsog,
1992. 417 p. : ill..

Cover title: Ammoniakfordampning fra kvaeg- og svinegyfle under
lagring og efter udbringning pa jorden.

SB87.D4B47-nr.S2209

7. Ammonia volatilization from liquid hog manure: influence of
aeration and trapping systems.
O'Halloran, I. P.

Soil-Sci-Soc-Am-j. [Madison, Wis.] Soil Science Society of
America. Sept/Oct 1993. v. 57 (5) p. 1300-1303.

Includes references.

Descriptor: ammonia-; volatilization-; measurement-; pig-manure;
liquid-manures; laboratory-methods; sulfuric-acid; boric-acid;
efficacy-; aerobic- treatment

Abstract: Measurements of N loss from manures may reflect
differences in the types of manures and methodologies used.
This study's objective was to test the suitability of 0.32 M
H3BO3 and 0.9 M H2SO4 for trapping NH3 volatilized from liquid
hog manure (LHM) under various experimental conditions.
Samples of LHM were incubated for 15 d in containers with
aeration outlets positioned above, at the middle, or at the
bottom of the LHM. Lowering the position of the aeration outlet
increased both the pH of the LHM and the amount of NH3
volatilized. More NH3 was trapped in H2SO4 than H3BO3, and the
difference in trapping efficiency of the two acids increased with
their NH3 concentrations. Neither the amount of NH3 trapped
nor the exponential relationship between the NH4+
concentrations of two H3BO3 traps in series was influenced by
changing the bubble path length through the acid. Regression
analysis indicated that > 95% trapping efficiency was obtained
only when the NH3 concentration of H3BO3 was below 0.42 mg N

mL-1, much lower than the 0.9 mg N mL-1 reported to be the limit for using H3BO3 in the Kjeldahl method. Even when using two traps in series, H3BO3 appeared to trap less NH3 than H2SO4. Amending LHM with sucrose lowered the pH of H3BO3 used to trap volatilized NH3, thereby interfering with NH3 determination and rendering H3BO3 unsuitable for determining NH3 volatilization. Investigators who use H3BO3 to measure NH3, volatilization in other systems must ensure that similar interferences do not occur and that NH3.

NAL Call No.: 56.9-So3

8. Ammoniakfordampning fra svinegylle og opkoncentreret biogasgylle : bestemt med en ny mikrometeorologisk massebalance-metode = Ammonia volatilization from pig slurry and concentrated anaerobic fermented slurry ; measured by a new micrometeorological mass-balance technique. Ammonia volatilization from pig slurry and concentrated anaerobic fermented slurry ; measured by a new micrometeorological mass-balance technique.
Sommer, S. G.

[Kobenhavn?] : Landbrugsministeriet, Statens Planteavlfsforsog, 1993. 27 p. : ill..
Summary in Danish and English.

SB87.D4B47--nr.S2252

9. Anaerobic sequencing batch reactor treatment of swine wastes at 20 degrees C, 25 degrees C, and 35 degrees C.
Schmit, C. G.; Dague, R. R.

Proc-Ind-Waste-Conf. Chelsea, Mich. : Lewis Publishers. 1994. v. 48 p. 541-549.

Meeting held on May 10-12, 1993, West Lafayette, Indiana.
Descriptor: pig-slurry; anaerobic-digestion; anaerobic-digesters; bioreactors-; temperature-; methane-production; biogas-
NAL Call No.: TP995.A1I5

10. Anaerobic digestion of pig manure mixed with sewage sludge.
Wong, M. H.

Biol-Wastes v.31, p.223-230. (1990).

Includes references.

Descriptor: pig-manure; pollutants-; water-pollution; mixtures-; sewage-sludge; waste-treatment; anaerobic-digestion; fermentation-; methane- production; biogas-; hong-kong; batch-fermentation

NAL Call No.: TD930.A32

11. Anaerobic digestion of piggery wastes.
Andreadakis, A. D.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.25, p.9-16. (1992).

Paper presented at the "International Specialized Conference," November 20-22, 1990, Nicosia, Cyprus.

Descriptor: piggery-effluent; anaerobic-digestion; biogas-; methane-; production-; utilization-; anaerobic-digesters;

design-; performance-

NAL Call No.: TD420.A1P7

12. Anaerobic sequencing batch reactor treatment of swine wastes.

Dague, R. R.; Pidaparti, S. R.

Proc-Ind-Waste-Conf p.751-760. (1992).

Meeting held May 14-16, 1991, West Lafayette, Indiana.

Descriptor: feedlot-wastes; pigs-; pig-slurry;

anaerobic-treatment; biological-treatment; bioreactors-; biogas-; methane-production

NAL Call No.: TP995.A1I5

13. Anaerobic treatment of swine wastewater using hybrid UASB reactors.

Lo, K. V.; Liao, P. H.; Gao, Y. C.

Bioresour-technol. Barking, Essex, England : Elsevier Applied Science ; New York, NY : Elsevier Science Publishing Co., 1991-.

1994. v. 47 (2) p. 153-157.

Includes references.

Descriptor: piggery-effluent; anaerobic-treatment; bioreactors-; performance-; methane-production; upflow-anaerobic-sludge-blanket

NAL Call No.: TD930.A32

14. Anaerobic versus aerobic treatment of pig slurry for odor control.

Williams, D. W.; Cumby, T. R.; Phillips, R.; Burton, C.

Pap-Am-Soc-Agric-Eng. St. Joseph, Mich. : American Society of Agricultural Engineers, . Summer 1991. (916005) 6 p.

Paper presented at the "1991 International Summer Meeting sponsored by the American Society of Agricultural Engineers," June 23-26, 1991, Albuquerque, New Mexico.

Descriptor: pig-slurry; anaerobic-treatment; aerobic-treatment; odor-abatement

NAL Call No.: 290.9-Am32P

15. Animal manure data sheet.

Hermanson, R. E.; Kalita, P. K.

Ext-bull-Wash-State-Univ,-Coop-Ext. Pullman, Wash. : The Extension, . May 1994. (1719,rev.) 4 p.

In subseries: Clean Water for Washington.

Descriptor: cattle-manure; pig-manure; poultry-manure; sheep-manure; physical-properties; fertilizer-analysis

NAL Call No.: 275.29-W27P

16. Application of bacterial product for zero-liquid-discharge pig waste management under tropical conditions.

Ong, H. K.; Choo, P. Y.; Soo, S. P.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.27, p.133-140. (1993).

In the series analytic: Appropriate waste management technologies / edited by G. Ho and K. Mathew. Proceedings of the International

Conference, held November 27-28, 1991, Perth, Australia.
Descriptor: pig-housing; litter-; sawdust-; waste-treatment;
aerobic-treatment; bacterial-products; carcass-quality; malaysia-
NAL Call No.: TD420.A1P7

17. Application of natural zeolites for the reduction of ammonia
emissions during the composting of organic wastes in a laboratory
composting simulator.
Bernal, M. P.; Lopez Real, J. M.; Scott, K. M.

Bioresource-Technol v.43, p.35-39. (1993).
Includes references.
Descriptor: composting-; straw-; pig-slurry; mixtures-; ammonia-;
emission-; nitrogen-; losses-; zeolites-; adsorbents-
NAL Call No.: TD930.A32

18. Bacteria additives to the changes in gaseous mass transfer
from stored swine manure.
Liao, C. M.; Bundy, D. S.

J-environ-sci-health,-Part-B,-Pestic-food-contam-agric-wastes.
New York, Marcel Dekker. 1994. v. B29 (6) p. 1219-1249.
Includes references.

Descriptor: pig-manure; bacteria-; waste-treatment; ammonia-;
methane-; hydrogen-sulfide; carbon-dioxide; emission-;
volatile-compounds; pollutants-
NAL Call No.: TD172.J61

19. Barn manure. 2., uberarbeitete und erw. Aufl. Stallmist :
fest und flussig : Entmisten, Lagern, Ausbringen.
Boxberger, J.; Eichhorn, H.; Seufert, H. 1.; Amon, T.

Dusseldorf : Beton-Verlag, 1994. 197 p. : ill..
Includes bibliographical references (p. 190-197).
Descriptors: Farm-manure; Cattle-Manure-Handling;
Swine-Manure-Handling
NAL Call No.: S655.B6--1994

20. The benefit of a catch crop in minimising nitrate leaching
from autumn and winter applied slurry and manure.
Gladwin, A.; Beckwith, C. P.

Asp-appl-biol p.149-152. (1992).
In the series analytic: Nitrate and farming systems / edited by
J.R. Archer, K.W.T. Goulding, S.C. Jarvis, C.M. Knott, I. Lord,
S.E. Ogilvy, J. Orson, K.A. Smith, and B. Wilson.

Descriptor: secale-cereale; catch-crops; nutrient-uptake;
nitrate-; leaching-; prevention-; farmyard-manure; pig-slurry;
cattle-slurry; application-date; autumn-; winter-;
west-midlands-of-england
NAL Call No.: QH301.A76

21. Bio-retentive properties of synthetic media for anaerobic
digestion of animal waste.
Hill, D. T.; Bolte, J. P.

Trans-A-S-A-E v.35, p.711-715. ill. (1992).

Includes references.

Descriptor: pig-slurry; slaughterhouse-waste;
anaerobic-treatment; biogas-; bioreactors-; methane-production;
waste-treatment

Abstract: The results from a three-year study involving three types of synthetic media for process intensification of anaerobic digestion of swine waste are reported. The three media types were a polyurethane foam, a woven nylon mesh and a polypropylene felt. The physical durability of the different media for the three six-month runs and the ability of each media type to retain bacterial growth within the reactors are reported. Evaluation of the three media types showed that the polyurethane foam material was effective in retaining bacterial culture, but was subject to physical degradation in a mixed reactor environment, and approximately 98% of the original media was lost during the study. The woven nylon mesh was extremely durable but its bio-retentive characteristics were the lowest of the three types. The polypropylene felt proved to be the best media material, showing good physical durability (i.e., no breakdown or loss) and excellent bio-retentive properties.

NAL Call No.: 290.9-AM32T

22. Biomass production in the treatment of swine waste and further utilization in carp husbandry. Biomassengewinnung bei der Schweinegullebehandlung und Weiterverwertung in der Karpfenaufzucht.
Kirchhof, W.

Aachen : Gesellschaft zur Forderung der Siedlungswasserwirtschaft an der RWTH Aachen, 1992. xv, 173 p. : ill..

Includes bibliographical references.

TD420.G48-Bd.133

23. Biotreatment of swine manure by intensive lagooning during winter.
La Noue, J. d.; Sevrin Reyssac, J.; Mariojouis, C.; Marcel, J.; Sylvestre, S.

Bioresour-technol v.50, p.213-219. (1994).

Includes references.

Descriptor: pig-manure; waste-treatment; biological-treatment;
lagoons-; winter-; food-chains; aquatic-organisms

NAL Call No.: TD930.A32

24. Bringing home the bacon.
Pruyne, R.

PennState-agric p.26-33. (1994).

Descriptor: pigs-; pig-farming; swine-diseases; pigmeat-;
meat-production; pig-housing; pig-manure; waste-disposal;
viral-diseases; quarantine-; somatotropin-; escherichia-coli;
pig-feeding; pig-fat; pennsylvania-

NAL Call No.: S451.P4P45

25. Carbon and nitrogen mineralization and ammonia volatilization from fresh, aerobically and anaerobically treated pig manure during incubation with soil.

Bernal, M. P.; Kirchmann, H.

Biol-Fertil-Soils v.13, p.135-141. (1992).

Includes references.

Descriptor: pig-manure; aerobic-treatment; anaerobic-treatment; ammonia-; carbon-; decomposition-; mineralization-; soil-biology; volatilization-; calcareous-soils

NAL Call No.: QH84.8.B46

26. Carbon, nitrogen and phosphorus concentrations in aggregates of organic waste-amended soils.

Mbagwu, J. S. C.; Piccolo, A.

Biol-Wastes v.31, p.97-111. (1990).

Includes references.

Descriptor: pig-slurry; cattle-slurry; sewage-sludge; aerobic-treatment; application-to-land; long-term-experiments; soil-; aggregates-; size-; distribution-; soil-chemistry; carbon-; nitrogen-; phosphorus-; concentration-; italy-

NAL Call No.: TD930.A32

27. Characterization of particles, ammonia and endotoxin in swine confinement operations.

Pickrell, J. A.; Heber, A. J.; Murphy, J. P.; Henry, S. C.; May, M. M.; Nolan, D.; Oehme, F. W.; Gillespie, J. R.; Schoneweis, D.

Vet-hum-toxicol v.35, p.421-428. (1993).

Includes references.

Descriptor: pig-housing; intensive-farming; intensive-husbandry; dust-; pig-manure; ammonia-; endotoxins-; particle-size; spatial-variation; ventilation-; spring-; summer-; winter-

NAL Call No.: SF601.A47

28. Chemical composition of cyanobacteria grown in diluted, aerated swine wastewater.

Canizares Villanueva, R. O.; Dominguez, A. R.; Cruz, M. S.; Rios Leal, E.

Bioresour-technol v.51, p.111-116. (1995).

Includes references.

Descriptor: phormidium-; spirulina-; cell-culture; waste-water; pig-manure; waste-water-treatment; biological-treatment; aerobic-treatment; algal- protein; biomass-; chemical-composition; spirulina-maxima

Abstract: The chemical composition of *Spirulina maxima* and *Phormidium* sp. biomasses grown on pretreated and diluted swine wastewater was determined. Analyses were carried out on lyophilized samples and compared with data from mineral media (controls). Analyses of *Phormidium* grown on aeration-stabilized wastewater (ASSW) were: protein (Nx 625) 62%, lipids 11%, carbohydrates (calculated by difference) 16%. For *Spirulina* in the same effluent, data were: protein 36%, lipids 6% and carbohydrates 44%. No crude fiber was found in any of the samples. The fatty acid profiles of both biomasses showed important differences when compared to controls. The biomasses contained all the essential amino acids. The *Spirulina* biomass had a significantly higher content of pyridoxine, riboflavin and

pantothenic and nicotinic acids than Phormidium when grown on ASSW, but in general the vitamin content of both biomasses was practically the same as their respective controls. The results suggest that Phormidium and Spirulina biomasses could be used as dietary supplements in animal feed, but further studies are needed to determine the nutritional value of the product.

NAL Call No.: TD930.A32

29. Chemical treatment of swine wastewater.

Gao, Y. C.; Liao, P. H.; Lo, K. V.

J-Environ-Sci-Health-Part-A-Environ-Sci-Eng v.A28, p.795-807. (1993).

Includes references.

Descriptor: pig-manure; pig-slurry; waste-water-treatment; chemical-treatment; chemicals-; biochemical-oxygen-demand; chemical-oxygen-demand; phosphates-; dosage-; british-columbia; suspended-solids; total-solids

NAL Call No.: TD172.J6

30. Chronic copper poisoning in sheep grazing pastures fertilized with swine manure.

Kerr, L. A.; McGavin, H. D.

J-Am-Vet-Med-Assoc v.198, p.99-101. (1991).

Includes references.

Descriptor: ewes-; copper-; poisoning-; pig-manure; fertilizers-; grazing-; molybdenum-; symptoms-; histopathology-; mortality-; pregnancy-; case- reports

NAL Call No.: 41.8-Am3

31. A combined anaerobic--aerobic process for the co-treatment of effluents from a piggery and a cheese factory.

Montuelle, B.; Coillard, J.; Le Hy, J. B.

J-Agric-Eng-Res v.51, p.91-100. (1992).

Includes references.

Descriptor: piggery-effluent; cheesemaking-; effluents-; anaerobic-treatment; aerobic-treatment; biogas-; production-; france-

Abstract: Food processing industries can cause serious environmental problems. In particular, piggeries and milk/cheese factories need improved treatment of their wastewater, especially if land-spreading of wastes is not possible, limited or forbidden. This paper reports on a study of a treatment plant whose originality lies in the combination of two treatment stages, the first anaerobic, the second aerobic. The technical problems encountered during the installation of the digester and the optimization of the working of the whole treatment plant during 2 years are analysed and discussed. Besides a daily monitoring of the anaerobic stage, complete measurements were carried out on the treatment process in order to control the steady state performance of the plant. The biogas produced is used in a cheese factory and allows propane consumption to be reduced by 26%. The anaerobic digestion of the slurry, followed by a settling process, leads to changes in the nature of the effluent entering the aerobic stage. In particular, the C/N

ratio would be unfavourable for the denitrification process, without the cheese factory washing-water, which brings the necessary organic carbon. The reduction in organic load achieved by the digester (94% reduction of BOD and 74% of soluble COD) allows sufficient concentrations to maintain a good aerobic oxidation and a good nitrification process in the oxidation ditch. Overall the whole treatment process achieves 98% COD reduction, more than 99% BOD reduction and 93% N reduction.
NAL Call No.: 58.8-J82

32. Combining swine housing units into a system of buildings.
Muehling, A. J.; Collins, E. R. Jr.; Mohling, S.; Mohling, K.

Pork industry handbook. West Lafayette, Ind. : Cooperative Extension Service, Purdue University, [1978?-1990].. 4 p.
In the subseries: Housing. (PIH-22), revised December 1991.
Descriptor: pigs-; pig-housing; site-selection; drainage-; pig-manure; farrowing-houses; fire-prevention; building-construction; landscaping-; usa-
NAL Call No.: SF395.P62

33. A comparison of models for predicting slurry production on a pig farm.
Williams, A. G.; Streader, W. V.

Biol-Wastes v.31, p.187-197. (1990).
Includes references.

Descriptor: pig-farming; pig-slurry; production-; prediction-; models-
NAL Call No.: TD930.A32

34. A comparison of runoff quality effects of organic and inorganic fertilizers applied to fescuegrass plots.
Edwards, D. R.; Daniel, T. C.

Water-resour-bull v.30, p.35-41. (1994).
Includes references.

Descriptor: poultry-manure; pig-manure; npk-fertilizers; runoff-; water-quality; festuca-arundinacea; pastures-; pollution-; arkansas-; nonpoint-source-pollution

Abstract: Application of fertilizer can degrade quality of runoff, particularly during the first post-application, runoff-producing storm. This experiment assessed and compared runoff quality impacts of organic and inorganic fertilizer application for a single simulated storm occurring seven days following application. The organic fertilizers used were poultry (*Gallus gallus domesticus*) litter, poultry manure, and swine (*Sus scrofa domesticus*) manure. All fertilizers were applied at an application rate of 217.6 kg N/ha. Simulated rainfall was applied at 50 mm/h for an average duration of 0.8 h. Runoff samples were collected, composited, and analyzed for nitrate N (NO₃-N), ammonia N (NH₃-N), total Kjeldahl N (TKN), ortho-P (PO₄-P), total P (TP), chemical oxygen demand (COD), total suspended solids (TSS), fecal coliforms (FC), and fecal streptococci (FS). Application of the fertilizers did not alter the hydrologic characteristics of the receiving plots relative to the control plots. Concentrations of fertilizer constituents were almost

always greater from treated than from control plots and were usually much greater. Flow-weighted mean concentrations of NH₃-N, PO₄-P, and TP were highest for the inorganic fertilizer treatment (42.0, 26.6, and 27.9 mg/L respectively). Runoff COD and TSS concentrations were greatest for the poultry litter treatment. Concentrations of FC and FS were greater for fertilized than for control plots with no differences among fertilized plots, but FC concentrations for all treatments were in excess of Arkansas' primary and secondary contact standards. Mass losses of fertilizer constituents were low (< 3 kg/ha) and were small proportions (< 3).

NAL Call No.: 292.9-Am34

35. Comparisons of biological and chemical methods to predict nitrogen mineralization in animal wastes.

Serna, M. D.; Pomares, F.

Biol-Fertil-Soils v.12, p.89-94. (1991).

Includes references.

Descriptor: zea-mays; pig-manure; poultry-manure; nitrogen-; mineralization-; nutrient-availability; nutrient-uptake; prediction-; waste-disposal; spain-

NAL Call No.: QH84.8.B46

36. Composition and digestibility of untreated and chemically treated animal excreta for ruminants: a review.

Flachowsky, G.; Hennig, A.

Biol-Wastes v.31, p.17-36. (1990).

Includes references.

Descriptor: pig-slurry; poultry-manure; cattle-dung; chemical-treatment; feeds-; production-; sheep-feeding; nutrient-content; mineral-content; digestibility-; reviews-; waste-utilization

NAL Call No.: TD930.A32

37. Composition of fresh, aerobic and anaerobic farm animal dungs.

Kirchmann, H.; Witter, E.

Bioresource-Technol v.40, p.137-142. (1992).

Includes references.

Descriptor: cattle-dung; pig-manure; poultry-droppings; anaerobic-treatment; aerobic-treatment; chemical-analysis

NAL Call No.: TD930.A32

38. Composting of separated solid swine manure.

Liao, P. H.; Vizcarra, A. T.; Chen, A.; Lo, K. V.

J-environ-sci-health, -Part-A, -Environ-sci-eng. New York, Marcel Dekker. 1993. v. 28 (9) p. 1889-1901.

Includes references.

Descriptor: pig-manure; composting-; efficiency-; moisture-content; temperature-; volatile-fatty-acids; volatility-; odor-emission; waste-treatment

NAL Call No.: TD172.J6

39. Composting of separated solid swine wastes.
Lo, K. V.; Lau, A. K.; Liao, P. H.

J-Agric-Eng-Res v.54, p.307-317. (1993).

Includes references.

Descriptor: pig-manure; solid-wastes; separation-; composting-; waste-treatment; bulking-agents; composts-; quality-

Abstract: The effects of various bulking agents were examined on the efficiency of composting the fibrous solids obtained from swine manure after a liquid/solids separation process. The effects on the quality of the resulting composts were also examined. The separated solids were either composted without bulking agents, or mixed with different portions of peat moss and/or sawdust. Aeration rates were also varied in different experimental sets. A self-heating mode of operation was adopted. The results indicated that the fibrous solids from a liquid/solids separation process could be composted in small reactors with or without the addition of bulking agents. The composting masses reached thermophilic temperatures (45-70 degrees C) and met regulatory requirements with or without aeration. Aeration rates of 0.04 to 0.08 l/min per kg volatile matter and an intermittent mode of aeration are recommended for the composting of separated swine manure. Based on measured compost characteristics and composition, the finished composts made from a manure/peat moss mixture had the best quality in terms of moisture content, nitrogen content, carbon-to-nitrogen ratio and colour of the product.

NAL Call No.: 58.8-J82

40. Composting sweetens smell of swine manure.

McCaskey, T.; Little, J.

Highlights-agr-res v.41, p.13-14. (1994).

Descriptor: pigs-; pig-manure; fertilizers-; odors-; composting-; waste-disposal; economic-analysis

NAL Call No.: 100-AllH

41. A computer model for predicting ammonia release rates from swine manure pits.

Zhang, R.; Day, D. L.; Christianson, L. L.

Pap-Am-Soc-Agric-Eng. St. Joseph, Mich. : American Society of Agricultural Engineers, . Winter 1992. (92-4501/92-4519) 15 p.

Paper presented at the "1992 International Winter Meeting sponsored by the American Society of Agricultural Engineers," December 15- 18, 1992, Nashville, Tennessee.

Descriptor: animal-manures; ammonia-; degradation-; velocity-; temperature-; manure-temperature

NAL Call No.: 290.9-Am32P

42. A computer model for predicting ammonia release rates from swine manure pits.

Zhang, R. H.; Day, D. L.; Christianson, L. L.; Jepson, W. P.

J-agric-eng-res v.58, p.223-229. (1994).

Includes references.

Descriptor: pig-manure; ammonia-; emission-; air-; velocity-;

aeration-; temperature-; simulation-models; prediction-
NAL Call No.: 58.8-J82

43. Concentrations of malodorous compounds in swine wastes during storage.

Lo, K. V.; Chen, A.; Liao, P. H.

J-environ-sci-health,-Part-A,-Environ-sci-eng v.29, p.83-98. (1994).

Includes references.

Descriptor: pig-slurry; odors-; storage-; temperature-; chemical-analysis; chemical-composition; volatile-fatty-acids; phenols-; indoles-; gas- chromatography

NAL Call No.: TD172.J6

44. Constructed wetland for treating swine lagoon effluent.

Payne, V. W. E.; McCaskey, T. A.; Eason, J. T.

Pap-Am-Soc-Agric-Eng. St. Joseph, Mich. : American Society of Agricultural Engineers,. Winter 1992. (92-4526) 6 p.

Paper presented at the "1992 International Winter Meeting sponsored by the American Society of Agricultural Engineers," December 15- 18, 1992, Nashville, Tennessee.

Descriptor: pigs-; lagoons-; effluents-; waste-water-treatment; wetlands-; construction-

NAL Call No.: 290.9-Am32P

45. Constructed wetland treatment of swine wastewater.

Hunt, P. G.; Humenik, F. J.; Szogi, A. A.; Rice, J. M.; Stone, K. C.; Cutts, T. T.; Edwards, J. P.

Pap-Am-Soc-Agric-Eng. St. Joseph, Mich. : American Society of Agricultural Engineers,. Winter 1993. (93-2601/93-3510) 12 p.

Paper presented at the "1993 International Winter Meeting sponsored by the American Society of Agricultural Engineers," December 14- 17, 1993, Chicago, Illinois.

Descriptor: wetlands-; waste-water-treatment; animal-wastes; glycine-max; oryza-sativa; nitrogen-; redox-potential; redox-reactions

NAL Call No.: 290.9-Am32P

46. Constructed wetlands successfully treat swine wastewater.

McCaskey, T. A.; Eason, J. T.; Hammer, D. A.; Pullin, B. P.; Payne, V. W. E.; Bransby, D. I.

Highlights-Agric-Res-Ala-Agric-Exp-Stn v.39, p.13. (1992).

Descriptor: pigs-; waste-water; waste-water-treatment; wetlands-; aquatic-plants; ammonia-; nitrogen-content; alabama-

NAL Call No.: 100-AL1H

47. Continuous aerobic treatment of piggery slurry for odour control scaled up to a farm-size unit.

Sneath, R. W.; Burton, C. H.; Williams, A. G.

J-Agric-Eng-Res v.53, p.81-92. (1992).

Includes references.

Descriptor: pig-housing; pig-slurry; aerobic-treatment;
odor-emission; odor-abatement; technology-; performance-;
prediction-; installations-; design-; nitrogen-; losses-; uk-;
chemical-oxygen-demand

Abstract: Effective aerobic treatment of piggery slurry was achieved in a continuous farm scale process sited at a small piggery (2000 pigs). The plant design and the operating conditions were based on data obtained from pilot-scale studies with the aim of preventing or reducing odours from pig slurry at a minimum cost. Raw slurry was separated before passing into the main treatment vessel. Aeration was achieved by recirculating of slurry (achieving jet mixing of the tank contents) through a venturi where air was entrained. Aeration was controlled to maintain redox potential between 100 and 200 mV E(h). Slurry was added and withdrawn at hourly intervals, to provide nominal residence times of 1, 2 and 4 days. The performance of the aerobic treatment process in terms of COD reduction could be predicted using data from laboratory and pilot-scale experiments. Some allowance could be made for minor feed fluctuations but a more comprehensive model will be necessary for predictions where larger variations occur in operating conditions. Assessments were made of odour quality using dynamic dilution olfactometers for odour strength, and volatile fatty acids (VFA) concentration as an indicator of odour offensiveness. Results indicate that pilot-scale experiments may overestimate by 10-20% what can be achieved with the farm-scale plant. Nitrogen losses were greatest in the 4-day residence time trial with 56% lost in the form of N₂ gas following a nitrification/denitrification process. Conversely, in the short residence time trials, virtually all of the nitrogen was conserved.

NAL Call No.: 58.8-J82

48. Continuous solid-substrates fermentation of swine waste recovered solids for pig feed.

Iniguez Covarrubias, G.; Robles Cabrera, A.; Franco Gomez, M. J. de.

Bioresour-technol v.50, p.139-147. (1994).

Includes references.

Descriptor: pig-manure; fermentation-; sludges-; pig-feeding;
feed-supplements; nutritive-value; trials-; refeeding-;
feeding-trials; pig-manure-solids; fermented-wastes;
fermentation-solids

NAL Call No.: TD930.A32

49. Copper fractions extracted by Mehlich-3 from soils amended with either CuSO₄ or copper rich pig manure.

Reed, S. T.; Allen, M. G.; Martens, D. C.; McKenna, J. R.

Commun-Soil-Sci-Plant-Anal v.24, p.827-839. (1993).

Includes references.

Descriptor: zea-mays; soil-testing; extraction-; copper-;
soil-test-values; nutrient-availability; mineral-deficiencies;
soil-toxicity; analytical-methods; comparisons-; copper-sulfate;
pig-manure; nutrient-uptake; nutrient-content; crop-yield;
grain-; virginia-; rhododulfts-

NAL Call No.: S590.C63

50. Decolourisation of a pigment plant effluent by *Pycnoporus cinnabarinus* in a packed-bed bioreactor.
Schliephake, K.; Lonergan, G. T.; Jones, C. L.; Mainwaring, D. E.

Biotechnol-lett v.15, p.1185-1188. (1993).

Includes references.

Descriptor: pycnoporus-; pigments-; factory-effluents;
biological-treatment; decolorization-; white-rot-fungi

Abstract: The decolourisation of wastewater from a pigment plant by the white-rot fungus *Pycnoporus cinnabarinus* was studied in a packed-bed bioreactor. Decolourisation was first observed 48 to 72 h after inoculation and was followed using UV/VIS spectrophotometry. An assessment of the inhibitory properties of the effluent on the growth of *Pycnoporus cinnabarinus* showed that this fungus can tolerate high levels of potentially toxic waste.

NAL Call No.: QR53.B56

51. Degradation of *Giardia lamblia* cysts in mixed human and swine wastes.

Deng, M. Y.; Cliver, D. O.

Appl-Environ-Microbiol v.58, p.2368-2374. (1992).

Includes references.

Descriptor: septic-tank-effluent; animal-manures; slurries-;
giardia-lamblia; cysts-; persistence-; degradation-; viability-

Abstract: This study was conducted to determine the persistence of *Giardia lamblia* cysts in mixed septic tank effluent and swine manure slurry and to correlate fluorescein diacetate-propidium iodide staining of *G. lamblia* cysts with their morphology under low-voltage scanning electron microscopy. Under field conditions, *G. lamblia* cysts were degraded more rapidly in the mixed waste than in the control Dulbecco's phosphate-buffered saline (PBS). For total and viable cysts, the mixed waste had D values (time for a 90% reduction in number of cysts) of 18.3 and 15.5 days, and the Dulbecco's PBS control had D values of 41.6 and 26.8 days. The rates of cyst degradation in septic tank effluent and in Dulbecco's PBS were similar. Increasing the proportion of swine manure slurry in the mixed waste favored degradation of the parasite. These results indicate that the mixed waste treatment was the predominant factor affecting the cyst persistence and that it was swine manure slurry that played the role of degrading the parasite. Visualization of viable and nonviable *Giardia* cysts with low-voltage scanning electron microscopy revealed an excellent correlation between the viability of the cysts determined by fluorescein diacetate-propidium iodide staining and their electron microscopic morphology.

NAL Call No.: 448.3-AP5

52. Detection of hepatitis A virus in environmental samples by antigen-capture PCR.

Deng, M. Y.; Day, S. P.; Cliver, D. O.

Appl-environ-microbiol v.60, p.1927-1933. (1994).

Includes references.

Descriptor: hepatitis-a-virus; polymerase-chain-reaction; immunological-techniques; detection-; oysters-; clams-; ostreidae-; pig-slurry; cattle-slurry; food-contamination; microbial-contamination

Abstract: The efficacy of the antigen-capture PCR (AC-PCR) method for the detection of hepatitis A virus (HAV) in environmental samples was demonstrated. HAV was captured from a seeded liquid waste or a shellfish sample with homologous antibody and then heat denatured and subjected to reverse transcription and the PCR, all in the same tube. Subsequently, the AC-PCR products were analyzed by oligonucleotide probe hybridization in solution, agarose gel electrophoresis, and autoradiography. The AC-PCR detected as little as 0.053 PFU of cell culture- adapted HAV strain HM175/18f. The results of cDNA-RNA hybridization indicated that the particle/ PFU ratio of this virus strain is approximately 79:1. Therefore, the detection limit of the AC-PCR was estimated to be four virus particles. No amplified products were observed when poliovirus 1, coxsackievirus A9, coxsackievirus B3, echovirus 6, reovirus 1, adenovirus type 40, human rotavirus type 1, and bovine enterovirus type 2 were tested, confirming the specificity of the assay. There were no differences between the nucleotide sequences of AC-PCR products of HAV strain HM175/18f and the sequences of wild-type HAV strain HM175 derived from molecularly cloned cDNA. Of 121 waste and shellfish samples tested by both plaque assays (PA) in cell cultures and the AC-PCR, 81 (67%) were positive and 31 (26%) were negative as determined by both methods, whereas 9 (7%) were positive as determined by the AC-PCR and negative as determined by the PA, and none were positive as determined by the PA and negative as determined by the AC-PCR.

NAL Call No.: 448.3-Ap5

53. Development of a composting recipe for swine manure.
Collins, E. R. Jr.; Parson, S. C.

Pap-Am-Soc-Agric-Eng. St. Joseph, Mich. : American Society of Agricultural Engineers, . Summer 1993. (934033) 29 p.
Paper presented at the "1993 International Summer Meeting sponsored by The American Society of Agricultural Engineers," and The Canadian Society of Agricultural Engineering," June 20-23, 1993, Spokane, Washington.

Descriptor: pig-manure; composting-; recipes-; performance-

NAL Call No.: 290.9-Am32P

54. Development of a computer program (UTILIS) for correct pig slurry management.
Balsari, P.; Calvo, A.; Airoidi, G.

Computers in agricultural extension programs proceedings of the 4th international conference, 28-31 January 1992, Orlando, Florida / sponsored by the Florida Cooperative Extension Service, University of Florida. St. Joseph, Mich. : American Society of Agricultural Engineers, c1992.. p. 559-564.

Includes references.

Descriptor: pig-slurry; waste-disposal; computer-software

NAL Call No.: S494.5.D3C68-1992

55. Development of an on-site moderate and limited small farm wastewater treatment plant.
Yang, P. Y.; Chen, H.; Kongricharoen, N.; Polprasert, C.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.27, p.115-121. (1993).

In the series analytic: Appropriate waste management technologies / edited by G. Ho and K. Mathew. Proceedings of the International Conference, held November 27-28, 1991, Perth, Australia.

Descriptor: waste-water-treatment; small-farms; bioreactors-; pig-slurry; hawaii-; on-farm-treatment

NAL Call No.: TD420.A1P7

56. Dietary manipulation of nitrogen excretion and slurry volume from pigs.

Fullarton, P. J.; Cullin, A. W. R.; Broecke, J. v. d.

Asp-appl-biol p.145-148. (1992).

In the series analytic: Nitrate and farming systems / edited by J.R. Archer, K.W.T. Goulding, S.C. Jarvis, C.M. Knott, I. Lord, S.E. Ogilvy, J. Orson, K.A. Smith, and B. Wilson.

Descriptor: pigs-; pig-slurry; excretion-; nitrogen-; excreta-; nitrogen-metabolism; experimental-diets; feeds-; protein-content

NAL Call No.: QH301.A76

57. A direct incorporation of N-15 labelled ammonium sulphate into a pig slurry: a laboratory experiment on NH₃ volatilization.
Moal, J. F.; Martinez, J.; Marol, C.; Guirand, G.

Bioresour-technol. Barking, Essex, England : Elsevier Applied Science ; New York, NY : Elsevier Science Publishing Co., 1991-. 1994. v. 48 (1) p. 87-89.

Includes references.

Descriptor: pig-slurry; isotope-labeling; nitrogen-; ammonium-sulfate; incorporation-; ammonia-; volatilization-; laboratory-methods; nitrogen-; losses-

NAL Call No.: TD930.A32

58. Drying interval effects on runoff from fescue plots receiving swine manure.

Edwards, D. R.; Daniel, T. C.

Trans-ASAE v.36, p.1673-1678. (1993).

Includes references.

Descriptor: pig-manure; drying-; runoff-; nitrate-nitrogen; ammonium-nitrogen; nitrogen-; phosphorus-; runoff-water;

water-pollution; festuca- arundinacea; fields-; water-quality

Abstract: Application of swine (*Sus scrofa domestica*) manure can lead to elevated runoff concentrations of organic matter and nutrients. This experiment was conducted to assess the influences of swine manure treatment (0 and 220 kg/ha nitrogen applied) and drying interval (4, 7, and 14 days) between manure application and first runoff event on quality of runoff from fescue (*Festuca arundinacea* Schreb.) plots. Runoff was generated from simulated rainfall (50 mm/h) and sampled at 0.08 h intervals during runoff. Flow-weighted composite runoff samples from each

treatment and replication were analyzed for nitrate nitrogen (NO₃(-)N), ammonia nitrogen (NH₃(-)N), total Kjeldahl nitrogen (TKN), total phosphorus (TP), chemical oxygen demand (COD), and total suspended solids (TSS). One set per treatment of the noncomposited runoff samples was also analyzed. Runoff concentrations of all manure constituents investigated were higher for the manure-treated plots than for the untreated plots. Runoff NO₃(-)N increased with drying interval due to nitrification, but concentrations of other manure constituents were unaffected by drying interval. Amounts of constituents lost from the plots in runoff were higher for the manure-treated plots than for the untreated plots, but all (including NO₃(-)N) losses were found independent of drying interval. Analyses of the noncomposited runoff samples revealed high variability in the response of runoff quality to time after the beginning of runoff for all parameters investigated. Data from the non-composited samples did not lend itself to generalized descriptions of changes with respect to time of runoff concentrations of manure constituents.

NAL Call No.: 290.9-Am32T

59. Economic impact of a swine complex in Southside Virginia. Thornsby, S.; Kambhampaty, S. M.; Kenyon, D.

Publication collection, Virginia Cooperative Extension Service. 1993. (448-215) 14 p.

Includes references.

Descriptor: pig-farming; econometric-models; agroindustrial-complexes; economic-impact; environmental-impact; regional-planning; animal-wastes; virginia-; impact-analysis-for-planning-implan; virginia-impact-projection-vip

NAL Call No.: S544.3.V8V52

60. Economic impact of varying swine manure application rates on continuous corn.

Chase, C.; Duffy, M.; Lotz, W.

J-Soil-Water-Conserv v.46, p.460-464. (1991).

Includes references.

Descriptor: zea-mays; pig-manure; fertilizers-; application-rates; economic-impact; crop-yield; soil-conditioners; production-costs; returns-; iowa-; buchanan-county,-iowa

NAL Call No.: 56.8-J822

61. Effect of form and rate of pig manure on the growth, nutrient uptake, and yield of barley (cv. Galleon).

Brechin, J.; McDonald, G. K.

Aust-j-exp-agric v.34, p.505-510. (1994).

Includes references.

Descriptor: hordeum-vulgare; piggery-effluent; application-rates; superphosphate-; urea-; pesticide-mixtures; growth-rate; nutrient-uptake; crop-yield; nitrogen-content; phosphorus-; sodium-; biomass-production; maize-ears; kernels-; weight-; south-australia

NAL Call No.: 23-Au792

62. Effect of manuring practices and increased copper concentrations on soil microbial populations.

Huysman, F.; Verstraete, W.; Brookes, P. C.

Soil-biol-biochem v.26, p.103-110. (1994).

Includes references.

Descriptor: soil-bacteria; soil-fungi; populations-; metal-tolerance; copper-; bioavailability-; pig-manure; application-to-land; heavy-metals; contamination-; soil-pollution; polluted-soils

Abstract: Addition of piggery manure to soils over 5 yr (manured soils) increased the amount of Cu extracted by EDTA and diethylenetriaminepentaacetic acid (DTPA) compared to selected reference soils. DTPA-extractable Cu ranged from about 3 to 10 $\mu\text{g Cu g}^{-1}$ soil in the manured soils and from about 1 to 2 $\mu\text{g Cu g}^{-1}$ soil in the reference soils. Although the soil Cu concentrations in the manured soils were many times smaller than currently permitted, the increase in DTPA- or EDTA-extractable Cu was correlated with a 10- to a 1000- fold increase in the number of aerobic Cu-resistant bacteria. Although the Cu was mainly concentrated in the plough layer (15 cm) of the manured soils, Cu-resistant bacteria were also detected down to 110 cm soil depth. In contrast, no such differences were found between the total number of colony forming units, total microbial biomass or the degree of Cu-resistance of fungi and anaerobic bacteria between manured and reference soils. It is suggested that the degree of Cu-resistance of the aerobic soil bacteria may provide a sensitive measure of Cu bioavailability in soil. In general, bacteria were more sensitive to Cu than fungi. All of the 42 Cu-resistant bacterial strains investigated were oxidase-positive and 50% of the strains were pigmented. In contrast, only 20% of the 37 Cu-sensitive bacterial strains investigated were oxidase-positive and none were pigmented. Cu-resistant bacteria exhibited more resistance to several antibiotics and heavy metals than Cu-sensitive bacteria.

NAL Call No.: S592.7.A1S6

63. Effect of natural substances on plants: biological control of telluric phytopathogenic fungi by an antifungal compost.

Reisinger, O.; Durecu, S.; Toutain, F.

Dev-Agric-Manage-For-Ecol p.145-153. (1992).

In the series analytic: Humus its structure and role in agriculture and environment / edited by J. Kubat. Proceedings of the 10th Symposium Humus et Planta, August 19-23, 1991, Prague, Czechoslovakia.

Descriptor: cucumis-sativus; linum-usitatissimum; fusarium-oxysporum-f; sp; -lini; phomopsis-sclerotioides; biological-control; composts-; pig-slurry; plant-nutrition; france-

Abstract: Antipathogenic activity of a compost prepared of the solid phase of anaerobically fermented pig slurry has been tested in laboratory and glasshouse experiments. It was shown that this compost sensibly limited the severity of pathogenic effect of *Fusarium oxysporum* f. sp. lini and diminished incidence of

Phomopsis sclerotioides with cucumber cultivated in naturally infected soil. Laboratory experiments have shown that there is at least one bacterial biological element responsible for induction and acceleration of autolysis of pathogenic fungi.

NAL Call No.: S601.D4

64. Effect of organic manure on organic phosphorus fractions in two paddy soils.

Zhang, Y. S.; Werner, W.; Scherer, H. W.; Sun, X.

Biol-fertil-soils v.17, p.64-68. (1994).

Includes references.

Descriptor: paddy-soils; ultisols-; entisols-; pig-manure; cattle-manure; cellulose-; soil-organic-matter; phosphorus-; inorganic-phosphorus; anaerobic- conditions; organic-phosphorus

NAL Call No.: QH84.8.B46

65. Effect of pH on the behaviour of volatile compounds in organic manures during dry-matter determination.

Derikx, P. J. L.; Willers, H. C.; Have, P. J. W. t.

Bioresour-technol. Barking, Essex, England : Elsevier Applied Science ; New York, NY : Elsevier Science Publishing Co., 1991-. 1994. v. 49 (1) p. 41-45.

Includes references.

Descriptor: pig-manure; cattle-manure; poultry-manure; drying-; dry-matter; ammonia-; volatile-compounds; volatile-fatty-acids; ph-; methodology-

NAL Call No.: TD930.A32

66. The effect of pig slurry on exchangeable potassium in calcareous soils.

Bernal, M. P.; Lax, A.; Roig, A.

Biol-fertil-soils v.16, p.169-172. (1993).

Includes references.

Descriptor: calcareous-soils; cation-exchange; exchangeable-cations; potassium-; pig-slurry; waste-disposal; illite-; interstratified-minerals; montmorillonite-; spain-

NAL Call No.: QH84.8.B46

67. The effect of spring applied animal slurries on cereal grain yield and quality.

Hayward, C. F.; Froment, M. A.; Harrison, R.

Asp-appl-biol. Wellesbourne, Warwick : The Association of Applied Biologists. 1993. v. 36 p. 311-316.

In the series analytic: Cereal quality III / edited by P.S.

Kettlewell, J.R. Gorstang, C.M. Duffus, N. Magan, W.T.B. Thomas and N.D. Paveley.

Descriptor: triticum-aestivum; cattle-slurry; pig-slurry; application-date; spring-; crop-yield; crop-quality; nitrogen-; lodging-; nitrogen-content

NAL Call No.: QH301.A76

68. Effect of sugarcane molasses on fermentation of pig faeces and wheat straw inoculated with lactic-acid-producing bacteria.

Kamra, D. N.; Srivastava, S. K.

Bioresour-technol. Barking, Essex, England : Elsevier Applied Science ; New York, NY : Elsevier Science Publishing Co., 1991-. 1994. v. 47 (1) p. 87-88.

Includes references.

Descriptor: sugarcane-byproducts; molasses-; pigs-; wheat-straw; fermentation-wastes; lactic-acid-bacteria; india-

NAL Call No.: TD930.A32

69. Effect of temperature on the performance of an SBR treating liquid swine-manure.

Fernandes, L.

Bioresour-technol. Barking, Essex, England : Elsevier Applied Science ; New York, NY : Elsevier Science Publishing Co., 1991-. 1994. v. 47 (3) p. 219-227.

Includes references.

Descriptor: liquid-wastes; pig-manure; bioreactors-; performance-; temperature-; kinetics-; models-; sequencing-batch-reactor

NAL Call No.: TD930.A32

70. Effect of the organic volumetric loading rate on soluble COD removal in down-flow anaerobic fixed-bed reactors.

Sanchez, E. P.; Weiland, P.; Travieso, L.

Bioresour-technol. Barking, Essex, England : Elsevier Applied Science ; New York, NY : Elsevier Science Publishing Co., 1991-. 1994. v. 47 (2) p. 173-176.

Includes references.

Descriptor: piggery-effluent; beef-cattle; cattle-manure; dairy-cattle; torula-; yeasts-; wastes-; anaerobic-digesters; chemical-oxygen-demand; models-; settled-wastes

NAL Call No.: TD930.A32

71. Effect of Zn-enriched organic manures on Zn nutrition of wheat and residual effect on soyabean.

Gupta, V. K.; SIngh, C. P.; Relan, P. S.

Bioresource-Technol v.42, p.155-157. (1992).

Includes references.

Descriptor: pig-manure; poultry-manure; zinc-; enrichment-; triticum-aestivum; glycine-max; nutrient-uptake; crop-yield; pot-experimentation; zinc-uptake

NAL Call No.: TD930.A32

72. Effectiveness of vegetative filter strips in retaining surface-applied swine manure constituents.

Chaubey, I.; Edwards, D. R.; Daniel, T. C.; Moore, P. A. Jr.; Nichols, D. J.

Trans-ASAE v.37, p.845-850. (1994).

Includes references.

Descriptor: festuca-arundinacea; pig-manure; liquid-manures; runoff-; grass-strips; filterability-; water-quality

Abstract: Simulated rainfall was used to evaluate the

effectiveness of vegetative filter strips (VFS) of varying lengths (0, 3, 6, 9, 15, and 21 m) in reducing sediment and nutrient losses from plots treated with liquid swine manure at 200 kg N/ha. Mass transport of ammonia nitrogen (NH₃-N), total Kjeldahl nitrogen (TKN), ortho-phosphorus (PO₄-P), total phosphorus (TP), and total suspended solids (TSS) was reduced significantly (p < 0.05) by fescue (*Festuca arundinacea* Schreb.) VFS. The 3 and 21 m VFS removed 65 and 87% of incoming TKN, 71 and 99% of incoming NH₃-N, 65 and 94% of incoming PO₄-P, and 67 and 92% of the incoming TP, respectively. Effectiveness of VFS, however, did not increase significantly beyond 3 m for TSS and chemical oxygen demand and averaged 61 and 50%, respectively. Mass transport of TKN, NH₃-N, PO₄-P, and TP was minimized at the 9 m VFS length. The VFS did not significantly reduce nitrate nitrogen and fecal coliform from the incoming runoff. First-order kinetics described the removal of manure constituents.

NAL Call No.: 290.9-Am32T

73. Effects of the application of pig slurry on some physico-chemical and physical properties of calcareous soils. Bernal, M. P.; Roig, A.; Lax, A.; Navarro, A. F.

Bioresource-Technol v.42, p.233-239. (1992).

Includes references.

Descriptor: pig-slurry; application-; calcareous-soils; physicochemical-properties; application-rates; soil-ph; soil-analysis; slurries-; analysis-; techniques-

NAL Call No.: TD930.A32

74. *Eichhornia crassipes* systems on three ammonium-containing industrial effluents (pectin, carcass-treatment wastes and manure): production and purification. Casabianca Chassany, M. L. d.; Boone, C.; Basseres, A.

Bioresource-Technol v.42, p.95-101. (1992).

Includes references.

Descriptor: eichhornia-crassipes; industrial-wastes; ammonium-; nitrogen-; pectins-; pig-manure; carcass-waste; treatment-; biomass-production; purification-; biotechnology-

NAL Call No.: TD930.A32

75. Emissions of nitrogen oxide gases during aerobic treatment of animal slurries. Burton, C. H.; Sneath, R. W.; Farrent, J. W.

Bioresour-technol. Barking, Essex, England : Elsevier Applied Science ; New York, NY : Elsevier Science Publishing Co., 1991-. 1993. v. 45 (3) p. 233-235.

Includes references.

Descriptor: pig-slurry; aerobic-treatment; emission-; nitrogen-oxides

Abstract: Quantities of nitrous oxide, N₂O, an important greenhouse gas, were found in the effluent gases from controlled continuous aerobic treatment of pig slurry. Where nitrifying-denitrifying conditions were encouraged (4-day treatment time and aeration to a redox potential of -50 mV

Ecal), concentrations of this gas at times exceeded 1500 ppm and accounted for 19% of the nitrogen lost from the slurry. Smaller concentrations of the gas (170 ppm) were found during short treatments (1.5 days) where nitrifying activity would not be expected; partial nitrification is a possible explanation. Quantities of nitric oxide (NO) (up to 100 ppm), and even small amounts of NO₂, were also found, suggesting these previously unquantified nitrogen transformation routes in the traditional nitrogen cycle exist in aerobic treatment processes.

NAL Call No.: TD930.A32

76. Enterobacterial and viral decay experimental models for anaerobic digestion of piggery waste.

Mateu, A.; Mata Alvarez, J.; Pares, R.

Appl-Microbiol-Biotech v.38, p.291-296. (1992).

Includes references.

Descriptor: pig-manure; piggery-effluent; anaerobic-digestion; fecal-coliforms; bacteriophages-; survival-; ammonia-; volatile-fatty-acids; inactivation-; models-; comparisons-; coliphages-; lagoon-stabilization; cell-free-synthetic-media

Abstract: A laboratory study was conducted to determine the effects of the continuous mesophilic anaerobic digestion of raw pig manure in two types of enteropathogenic microorganisms, bacterial and viral. Faecal coliforms (indigenous to pig manure) and coliphage f2 (ATCC 15766 B1) were used as a model for some indigenous enteropathogenic microorganisms. The study was completed with laboratory survival experiments in lagoon stabilization of raw pig manure, for both models. Experiments for f2 survival in cell-free synthetic medium were also carried out. The results show that the anaerobic digestion process is more effective in eliminating viral than bacterial particles. Some parameters related to the ultimate biogas yield and kinetics were also determined. Lagoon stabilization of raw pig manure provides a more suitable environment for the removal of faecal coliforms than does anaerobic digestion. Finally, it was concluded that volatile fatty acids appeared to be responsible for the elimination of faecal coliforms. The agent that causes f2 inactivation is not well identified, although in some cases it could be NH₃ that seems to act as a viricidal agent.

NAL Call No.: QR1.E9

77. Equipment for application of animal slurry in field experiments.

Petersen, J.

J-agric-eng-res v.59, p.97-109. (1994).

Includes references.

Descriptor: slurry-spreaders; cattle-slurry; pig-slurry; experimental-equipment; experimental-plots; band-placement; soil-injection; slurry-pumps

NAL Call No.: 58.8-J82

78. Estimated seepage losses from established swine waste lagoons in the lower coastal plain of North Carolina.

Huffman, R. L.; Westerman, P. W.

Trans-ASAE v.38, p.449-453. (1995).

Includes references.

Descriptor: pigs-; lagoons-; waste-water; seepage-;

coastal-plains; groundwater-; water-pollution; north-carolina

Abstract: Eleven well-established, swine waste lagoon systems in the lower coastal plain of North Carolina were examined for evidence of seepage losses to the superficial aquifer. The sites were selected to represent three major soil systems in the areas of North Carolina with the highest swine populations. Elevated ammonium concentration was the strongest indicator of seepage. Estimated seepage losses were small on 45% of the systems studied. On the remaining sites, estimates of total nitrogen export indicated moderate to severe seepage losses. Several of these were near surface waters that probably served as discharge points, minimizing the likelihood of extensive impact on groundwater quality. No assessment was made of effect on the receiving surface waters. There was no apparent relationship between seepage loss rates and major soil system or style of construction. Rather, the dominant factor appeared to be the soil materials used in construction.

NAL Call No.: 290.9-Am32T

79. Estimating lagoon size for swine waste management.

Nordstedt, R. A.; Baldwin, L. B.

Agric-Eng-Fact-Sheet-Fla-Coop-Ext-Serv. Gainesville, Fla. : The Service. 1990. (75) 2 p.

Descriptor: pig-manure; waste-disposal; lagoons-; size-; volume-; estimation-; florida-

NAL Call No.: S671.A38

80. Evaluation of denitrification losses by the acetylene inhibition technique in a permanent ryegrass field (*Lolium perenne* L.) fertilized with animal slurry or ammonium nitrate.

Schwarz, J.; Kapp, M.; Benckiser, G.; Ottow, J. C. G.

Biol-fertil-soils v.18, p.327-333. (1994).

Includes references.

Descriptor: cattle-slurry; pig-slurry; mixtures-;

ammonium-nitrate; denitrification-; dicyandiamide-;

losses-from-soil; ammonium-nitrogen; nitrate- nitrogen;

soil-water-content; soil-temperature; lolium-perenne;

permanent-grasslands

NAL Call No.: QH84.8.B46

81. Evaluation of overland flow treatment for swine lagoon effluent.

Hawkins, G. L.; Hill, D. T.; Rochester, E. W.; Wood, C. W.

Trans-ASAE v.38, p.397-402. (1995).

Includes references.

Descriptor: pigs-; lagoons-; effluents-; waste-water-treatment; overland-flow; application-to-land; slopes-; runoff-;

percolation-; leaching-; usa-

Abstract: Overland flow, on slopes of 5 and 11%, was used as a means of treating wastewater effluent from the second cell of a swine waste anaerobic lagoon system. Wastewater samples from

both surface runoff and soil percolate (depths of 0.3, 0.9, and 1.5 m) were collected and analyzed for TKN-N, NH₄-N, ON-N, NO₃-N, pH, COD, K, EC, and TP-P. Using these data, along with the hydraulic loading rates and quantitative runoff collection, mass balances on the above parameters were calculated to determine the surface treatment of the lagoon effluent. These mass balances suggest that overland flow is an excellent treatment system for liquid lagoon effluents with mass reductions of greater than 60% for all parameters on both slopes, except NO₃-N, which had an approximate increase of 1.7 times on the 11% slope. Samples collected from the three lysimeter depths (soil percolate) suggest that NO₃-N leaching from the plots may be a concern over an extended period of use. The runoff from overland flow systems of this type will require further treatment.

NAL Call No.: 290.9-Am32T

82. The evaluation of sawdust swine waste compost on the soil ecosystem, pollution and vegetable production.

Kao, M. M.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.27, p.123-131. (1993).

In the series analytic: Appropriate waste management technologies / edited by G. Ho and K. Mathew. Proceedings of the International Conference, held November 27-28, 1991, Perth, Australia.

Descriptor: composts-; pig-slurry; sawdust-; mixtures-; soil-pollution; zinc-; copper-; brassica-pekinensis; crop-yield; taiwan-

NAL Call No.: TD420.A1P7

83. Evaluation of swine waste composting in vertical reactors.

Lau, A. K.; Liao, P. H.; Lo, K. V.

J-Environ-Sci-Health-Part-A-Environ-Sci-Eng v.A28, p.761-777. (1993).

Includes references.

Descriptor: pig-manure; pig-slurry; composting-; waste-treatment; moisture-content; height-; temperature-; particle-size-distribution; shrinkage-; compaction-; statis-pile-system

NAL Call No.: TD172.J6

84. Evaluation of the stabilization level of pig organic waste: influence of humic-like compounds.

Govi, M.; Ciavatta, C.; Sitti, L.; Gessa, C.

Commun-soil-sci-plant-anal v.26, p.425-439. (1995).

Includes references.

Descriptor: pig-slurry; sludges-; pig-manure; straw-; composting-; composts-; maturation-; decomposition-; humification-; humic-acids; fulvic-acids; organic-matter; isoelectric-focusing; degradation-; degree-of-humification

NAL Call No.: S590.C63

85. Evaluation of various flocculants for the recovery of algal biomass grown on pig-waste.

Buelna, G.; Bhattarai, K. K.; De La Noue, J.; Taiganides, E. P.

Biol-Wastes v.31, p.211-222. (1990).

Includes references.

Descriptor: pig-farming; wastes-; biological-treatment;
chlorella-; ponds-; biomass-production; flocculants-;
sedimentation-; singapore-

NAL Call No.: TD930.A32

86. Exogenous isolation of mobilizing plasmids from polluted soils and sludges.

Top, E.; Smet, I. de.; Verstraete, W.; Dijkmans, R.; Mergeay, M.

Appl-environ-microbiol v.60, p.831-839. (1994).

Includes references.

Descriptor: polluted-soils; activated-sludge; plasmids-;
genetic-transformation; escherichia-coli; alcaligenes-;
gene-transfer; mating-; agricultural-soils; pig-manure;
sandy-loam-soils; conjugative-plasmids; alcaligenes-eutrophus;
conjugation-

Abstract: Exogenous plasmid isolation was used to assess the presence of mobilizing plasmids in several soils and activated sludges. Triparental matings were performed with *Escherichia coli* (a member of the gamma subgroup of the Proteobacteria) as the donor of an IncQ plasmid (pMOL155, containing the heavy metal resistance genes *czc*: Co(r), Zn(r), and Cd(r)), *Alcaligenes eutrophus* (a member of the beta subgroup of the Proteobacteria) as the recipient, and indigenous microorganisms from soil and sludge samples as helper strains. We developed an assay to assess the plasmid mobilization potential of a soil ecosystem on the basis of the number of transconjugants obtained after exogenous isolations. After inoculation into soil of several concentrations of a helper strain (*E. coli* CM120 harboring IncP [IncP1] mobilizing plasmid RP4), the log numbers of transconjugants obtained from exogenous isolations with different soil samples were a linear function of the log numbers of helper strain CM120(RP4) present in the soils. Four soils were analyzed for the presence of mobilizing elements, and mobilizing plasmids were isolated from two of these soils. Several sludge samples from different wastewater treatment plants yielded much higher numbers of transconjugants than the soil samples, indicating that higher numbers of mobilizing strains were present. The mobilizing plasmids isolated from Gent-O sludge and one plasmid isolated from Eislingen soil hybridized to the repP probe, whereas the plasmids isolated from Essen soil did not hybridize to a large number of rep probes (repFIC, repHI1, repHI2, repL/M, repN, repP, repT, repU, repW, repX). This indicates that in Essen soil, broad-host-range mobilizing.

NAL Call No.: 448.3-Ap5

87. Fate of biological and chemical contaminants from on-site disposal of liquid piggery wastes: results from a soil column study.

Lam, K. C.; Ng, S. L.; Neller, R. J.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.27, p.63-75. (1993).

In the series analytic: Appropriate waste management technologies

/ edited by G. Ho and K. Mathew. Proceedings of the International Conference, held November 27-28, 1991, Perth, Australia.

Descriptor: pig-housing; waste-disposal-sites; liquid-wastes; application-to-land; hong-kong

NAL Call No.: TD420.A1P7

88. The fate of nitrogen from 15N-labeled straw and green manure in soil-crop-domestic animal systems.

He, D. Y.; Liao, X. L.; Xing, T. X.; Zhou, W. J.; Fang, Y. J.; He, L. H.

Soil-sci v.158, p.65-73. (1994).

Includes references.

Descriptor: oryza-sativa; paddy-soils; pigs-; goats-; rice-straw; green-manures; application-to-land; feeds-; animal-manures; nitrogen-; recovery-; nutrient-availability; nitrogen-cycle

NAL Call No.: 56.8-So3

89. Fate of residuals in nitrification-denitrification treatment of piggery wastewaters.

Germirli, F.; Bortone, G.; Orhon, D.; Tilche, A.

Bioresour-technol. Barking, Essex, England : Elsevier Applied Science ; New York, NY : Elsevier Science Publishing Co., 1991-. 1993. v. 45 (3) p. 205-211.

Includes references.

Descriptor: piggery-effluent; nitrification-; denitrification-; waste-water-treatment; chemical-oxygen-demand; italy-; sequencing-batch-reactor

Abstract: A careful appraisal of piggery wastewaters should be made mainly because of their high content of organic constituents together with the nitrogen and stringent effluent limitations involved. Specific emphasis should be given to the COD of the wastewater as it contains, aside from a biodegradable portion, a residual fraction which persists throughout the treatment process. Experimental evaluations indicated that the effluent of a laboratory-scale SBR contained significant amounts of non-biodegradable COD. Since SBR was primarily operated to achieve nitrification- denitrification, a method previously developed for the assessment of the influent soluble inert COD, S(I) was modified in a way to reflect the possible impact of the nitrification and denitrification processes. The paper also summarizes the performance of SBR with respect to its nitrogen removal potential from piggery wastewaters.

NAL Call No.: TD930.A32

90. Feedlot runoff control--demonstration site: swine and beef lot--Location: Delaware County.

AE. Ames, Iowa : Cooperative Extension Service, Iowa State University. Nov 1993. (3077h) 2 p.

Descriptor: pigs-; beef-cattle; feedlots-; runoff-; feedlot-wastes; waste-disposal

NAL Call No.: S671.A22

91. Feedlot runoff control--Demonstration site: swine lot--location: Pocahontas County.

AE. Ames, Iowa : Cooperative Extension Service, Iowa State U

niversity. Dec 1993. (3077k) 2 p.
Descriptor: pigs-; feedlots-; feedlot-wastes; runoff-;
waste-disposal

NAL Call No.: S671.A22

92. Feedlot runoff control--demonstration site: swine
lot--Marshall County.

Lorimor, J.

AE. Ames, Iowa : Cooperative Extension Service, Iowa State U
niversity. Sept 1993. (3077f) 2 p.

Descriptor: pigs-; feedlots-; feedlot-effluent; feedlot-wastes;
demonstration-farms

NAL Call No.: S671.A22

93. Feedlot runoff control demonstration site: swine
lot--Pottawattamie County.

Lorimor, J.

AE. Ames, Iowa : Cooperative Extension Service, Iowa State
University. Feb 1994. (3077n) 2 p.

Descriptor: pig-farming; feedlot-wastes; runoff-;
farm-management; demonstration-farms; iowa-

NAL Call No.: S671.A22

94. Feedlot runoff control--demonstration site: swine
lot--Washington County.

AE. Ames, Iowa : Cooperative Extension Service, Iowa State U
niversity. Sept 1993. (3077e) 2 p.

Descriptor: pigs-; feedlots-; feedlot-effluent; feedlot-wastes;
waste-disposal; demonstration-farms

NAL Call No.: S671.A22

95. The fertilizer value of agricultural manure: simple rapid
methods of assessment.

Piccinini, S.; Bortone, G.

J-Agric-Eng-Res v.49, p.197-208. (1991).

Includes references.

Descriptor: pig-manure; dairy-cattle; cattle-manure;
chemical-analysis; analytical-methods; equations-; accuracy-;
instruments-; italy-

Abstract: This paper presents the results of a series of
analytical tests performed on pig and dairy cattle manure in
order to establish the extent of the correlation between: dry
matter (TS) and specific gravity (SG); TS and total Kjeldhal
nitrogen (TKN) and total phosphorus (Pt); SG and TKN and Pt. In
addition, two N-meters for field use were also used to estimate
the ammonium (NH4-H) content. All the variables (TS, SG, TKN,
Pt, NH4-N) show a high index of correlation for both the pig and
dairy cattle slurry and the linear relations applied proved
adequate in all cases. Though the precision of the equations is
not very high, the estimate for TKN and Pt content, obtained from
the relationship between the SG and these elements is
nevertheless acceptable for practical farm use of animal manure.

NAL Call No.: 58.8-J82

96. Iowa State University. Cooperative Extension Service. First steps : moving toward sustainability : livestock management (hogs). First steps; moving toward sustainability. [Ames, Iowa?] : Extension, [1990?] 1 videocassette (28 min.) : sd., col..

"Program was prepared with the support of USDA Agreement 88-COOP-1-3523."

Presents three hog producers who have made changes in their production methods, based on sustainable agricultural decisions involving productivity, high volume, and environmental concerns and effects. The changes range from a totally pasture farrowing and finishing process to a drug-free finishing process to having hogs pastured on a corn stubble field to provide manure to the field while they feed off the corn stubble and fallen cobs.

Videocassette-no.1234.

Swine-/ Swine-farrowing-facilities/ Manure-handling/ Sustainable-agriculture.

97. Flat bottom gravity drain gutters for swine manure.

Meyer, V. M.

PM-Iowa-State-Univ-Coop-Ext-Serv. Ames, Iowa : Iowa State University, Cooperative Extension Service. Aug 1992. (1377,rev.) 4 p.

Descriptor: pig-manure; pig-housing; piggery-effluent; drainage-systems; design-

NAL Call No.: 275.29-IO9PA

98. Flooring for swine.

Harmon, J. D.; Muehling, A. J.

Pork industry handbook -- p.1-6. (1993).

Descriptor: pigs-; floors-; floor-type; defecation-; pig-housing; feet-; lesions-; sanitation-; pig-manure

NAL Call No.: SF395.P62

99. Fly control on swine.

Williams, R. E.

E-Purdue-Univ-Coop-Ext-Serv. West Lafayette, Ind. : The Service. July 1992. (9,rev.) 2 p.

In subseries: Livestock Insects.

Descriptor: diptera-; pigs-; insect-control; insecticides-; spraying-; ovidicides-and-larvicides; pig-manure

NAL Call No.: SB844.I6P8

100. Free and immobilized cultures of Spirulina maxima for swine waste treatment.

Canizares, R. D.; Dominguez, A. R.; Rivas, L.; Montes, M. C.; Travieso, L.; Benitez, F.

Biotechnol-Lett v.15, p.321-326. (1993).

Includes references.

Descriptor: spirulina-; pigs-; excreta-; biological-treatment; immobilization-; ammonium-nitrogen

Abstract: We have analyzed the behavior of Spirulina maxima at increasing concentration of ammonium nitrogen present in swine waste when it is either growing in suspension or immobilized in

polymeric supports. We compared the response of *Spirulina maxima* growth to different concentrations of aeration stabilized swine waste (total phosphorus, ammonium nitrogen) as a way to determine the treatment efficiency of both systems. At a dilution of 50% of swine waste, the suspended system reached the best results for biomass concentration and nutrient removal. In the immobilized system at dilutions of 25 and 50% of swine waste, more than 90% ammonium nitrogen removal was obtained, and the optimal cell concentration for immobilization was 2 g/l (wet basis).

NAL Call No.: QR53.B56

101. Gravity drain gutter systems.
Meyer, D. J.

Pork industry handbook. West Lafayette, Ind. : Cooperative Extension Service, Purdue University, [1978?-1990].. 8 p.
Waste Management, (PIH-95) revised Dec 1990.

Descriptor: pig-farming; pig-housing; waste-disposal; pig-manure; sewerage-; gravity-; drainage-equipment

NAL Call No.: SF395.P62

102. Gravity drain gutter systems.
Meyer, D. J.

Ext-Bull-E-Coop-Ext-Serv-Mich-State-Univ. East Lansing, Mich. : The Service. June 1991. (1800, major rev.) 8 p.

In subseries: Pork Industry Handbook. Waste Management.

Descriptor: pig-manure; waste-disposal; drainage-systems

NAL Call No.: 275.29-M58B

103. Growth of *Spirulina maxima* on swine waste.
Canizares, R. O.; Dominguez, A. R.

Bioresource-Technol v.45, p.73-75. (1993).

Includes references.

Descriptor: pig-manure; aeration-; stabilizing-; waste-treatment; spirulina-; nutrient-uptake; biomass-production

NAL Call No.: TD930.A32

104. Headspace analysis of malodorous compounds from swine wastewater under aerobic treatment.

Chen, A.; Liao, P. H.; Lo, K. V.

Bioresour-technol. Barking, Essex, England : Elsevier Applied Science ; New York, NY : Elsevier Science Publishing Co., 1991-. 1994. v. 49 (1) p. 83-87.

Includes references.

Descriptor: piggery-effluent; aerobic-treatment; waste-water-treatment; volatile-compounds; aeration-; microbial-activities; acetic-acid; degradation-; gas-chromatography; headspace-gas-chromatography

NAL Call No.: TD930.A32

105. Hog-raising county cleans up.
Cribb, D.

Soil-Water-Conserv-U-S-Dep-Agric-Soil-Conserv-Serv v.11, p.6-7.

(1991).

Descriptor: pig-farming; animal-wastes; treatment-;
waste-water-treatment

NAL Call No.: aS622.S6

106. Ice effects on model manure tank walls.

Godbout, S.; Marquis, A.; Masse, D.

Appl-eng-agric v.10, p.95-99. (1994).

Includes references.

Descriptor: pig-manure; cold-storage; tanks-; stresses-; ice-;
models-

Abstract: The objective of the study was to evaluate the pressure exerted by frozen manure caps on the walls of concrete manure tanks. The research is aimed at improving design criteria for concrete manure tanks for cold climates. Scale models were used to determine the pressures exerted by ice caps resulting from 2% and 4% solids swine manures and to compare them to that exerted by a fresh water ice cap. For typical Quebec conditions, the highest mean ice pressure measured in laboratory tests was equivalent to 72 +/- 13 kPa from liquid manure. The circumferential stress was influenced by the liquid type but not by the filling methods and was significantly lower for the manure ice caps than for water ice. However, no significant differences in stresses were attributable to the two levels of solids content of the manures. This implies that the stress differences observed between water and manure ice are mainly due to the presence of urea which would have an effect on the thermal expansion.

NAL Call No.: S671.A66

107. Identification and biological activity of germination-inhibiting long-chain fatty acids in animal-waste composts.

Marambe, B.; Nagaoka, T.; Ando, T.

Plant-Cell-Physiol. Kyoto, Japanese Society of Plant Physiologists. June 1993. v. 34 (4) p. 605-612.

Includes references.

Descriptor: sorghum-bicolor; seed-germination; water-uptake;
atp-; alpha-amylase-; enzyme-activity; long-chain-fatty-acids;
composts-; poultry- droppings; pig-slurry; cattle-dung;
phenolic-compounds

Abstract: Long-chain fatty acids in germination-inhibiting animal-waste composts were identified by gas chromatography-mass spectrometry as myristic, palmitic, stearic, oleic, linoleic, and linolenic acids. These acids were found at concentrations greater than 0.25 mg (g dry compost)-1. The identified acids, together with lauric acid, and five kinds of short- and medium-chain fatty acid, were tested for their effects on the germination process of sorghum seeds. The authentic long-chain fatty acids, which were dissolved in a 1 : 9 (v/v) mixture of methanol and distilled water at 40 mg liter-1, significantly reduced the alpha-amylase activity, physiological water uptake, and ATP content of the germinating seeds during the first 24 h of imbibition, as well as the rate of germination of seeds. Among the tested fatty acids, myristic and palmitic acids were the

most potent inhibitors of germination. The inhibitory effects of long-chain fatty acids were stronger than those of the phenolic acids. The short- and medium-chain fatty acids did not have any significant germination-inhibitory effects at 40 mg liter⁻¹. The results indicate that the long-chain fatty acids are the dominant inhibitors of germination in animal-waste composts, and that the inhibition of the alpha- amylase activity in germinating sorghum seeds is one aspect of the mode of action of these long-chain fatty acids.

NAL Call No.: 450-P699

108. The impact of pollution controls on livestock--crop producers.

Schnitkey, G. D.; Miranda, M. J.

J-Agric-Resour-Econ v.18, p.25-36. (1993).

Includes references.

Descriptor: phosphorus-; runoff-; soil-pollution; pollution-control; livestock-enterprises; agricultural-land; crop-production; farmyard-manure; commercial-soil-additives; environmental-policy; livestock-numbers; application-methods; returns-; mathematical-models; pig-farming; maize-; discrete-time,-continuous-space-model; commercial-fertilizers; application-patterns

NAL Call No.: HD1750.W4

109. Improved utilisation of slurry nitrogen for arable cropping.

Smith, K. A.; Chambers, B. J.

Asp-appl-biol p.127-134. (1992).

In the series analytic: Nitrate and farming systems / edited by J.R. Archer, K.W.T. Goulding, S.C. Jarvis, C.M. Knott, I. Lord, S.E. Ogilvy, J. Orson, K.A. Smith, and B. Wilson.

Descriptor: pig-slurry; cattle-slurry; application-date; spring-; nitrogen-; nutrient-uptake; cereals-; top-dressings; ammonia-; volatilization-; england-

NAL Call No.: QH301.A76

110. In situ inactivation of animal viruses and a coliphage in nonaerated liquid and semiliquid animal wastes.

Pesaro, F.; Sorg, I.; Metzler, A.

Appl-environ-microbiol v.61, p.92-97. (1995).

Includes references.

Descriptor: bacteriophages-; bovine-parvovirus; encephalomyocarditis-virus; bovine-herpesvirus; rotavirus-; bovine-adenovirus; inactivation-; cattle- slurry; cattle-manure; pig-manure; liquid-manures; risk-; application-to-land; coliphage-f2; bovine-rotaviurs; bovine-rotavirus

Abstract: The persistence of five animal viruses, representing picorna-, rota-, parvo-, adeno-, and herpesviruses, and the coliphage f2 was determined in the field by exposing the viruses to different animal wastes and by adopting an established filter sandwich technique. This technique allows us to copy the natural state of viruses in the environment, where adsorption onto or incorporation into suspended solids may prolong virus survival.

Using filter sandwiches either equipped with porous (15 nm in diameter) or poreless polycarbonate (PC) membranes, it was possible to differentiate between overall virus inactivation and the effect of virucidal agents that act through poreless PC membranes. Depending on ambient temperature, pH, and type of animal waste, values for time, in days, required for a 90% reduction of virus titer varied widely, ranging from less than 1 week for herpesvirus to more than 6 months for rotavirus. Virus inactivation progressed substantially faster in liquid cattle manure, a mixture of urine and water (pH > 8.0), than in semiliquid wastes that consisted of mixtures of feces, urine, water, and bedding materials (pH < 8.0). Hitherto unidentified virucidal agents that permeate poreless PC membranes contributed substantially to the overall inactivation. On the other hand, substances that protect rotavirus and possibly other viruses from inactivation may be present in animal wastes. Together, the study showed that viruses contained in manure may persist for prolonged periods of time if stored under nonaerated conditions. At times of land application, this may lead to environmental contamination with pathogens.

NAL Call No.: 448.3-Ap5

111. Inactivation of poliovirus type 1 in mixed human and swine waste and by bacteria from swine manure.

Deng, M. Y.; Cliver, D. O.

Appl-Environ-Microbiol v.58, p.2016-2021. (1992).

Includes references.

Descriptor: pig-slurry; septic-tank-effluent; polioviruses-; inactivation-; bacteria-; antiviral-properties; temperature-; field-experimentation; laboratory- tests; enzymes-

Abstract: The persistence of poliovirus type 1 (PO1) in mixed septic tank effluent and swine manure slurry was determined, and the antiviral effects of several bacterial cultures isolated from swine manure slurry were demonstrated. In two field experiments, PO1 was consistently inactivated more rapidly in the mixed waste than in the control Dulbecco's phosphate-buffered saline (D-PBS). D values (time [in days] for a 90% reduction of virus titer) were 18.7 and 29.9 for the mixed waste and 56.5 and 51.8 for the D-PBS control, respectively. The virus inactivation in the mixed waste was temperature dependent. A comparison of PO1 inactivation in raw mixed waste, autoclaved mixed waste, and bacterium-free filtrate of raw mixed waste at the same pH and temperatures provided an initial demonstration that the virus inactivation in the mixed waste is related, at least in part, to microbial activity. At 25 degrees C, the D value was 6.8 for the mixed waste, 11.2 for the autoclaved mixed waste, and 10.5 for the bacterium-free filtrate of raw mixed waste. At 37 degrees C, D values were 1.3, 3.9, and 3.1 for these three suspending media, respectively. Three bacterial isolates which had shown antiviral effects in a screening test each caused virus inactivation in autoclaved mixed waste, in which the effect of other microorganisms was excluded. Inhibition of PO1 inactivation by protease inhibitors suggests that the virus inactivation in the mixed waste was due in part to proteolytic enzymes produced by bacteria in the waste.

NAL Call No.: 448.3-AP5

112. The influence of pig slurry fertilisation on the mineral content of horticultural crops grown in calcareous soils. Bernal, M. P.; Roig, A.

J-sci-food-agric v.62, p.129-135. (1993).

Includes references.

Descriptor: pig-slurry; capsicum-annuum; lactuca-sativa; lycopersicon-esculentum; mineral-content; calcareous-soils

Abstract: The influence of pig slurry applications on the nutrient composition of three horticultural crops (pepper, tomato and lettuce) grown on two calcareous soils under irrigated conditions was studied. The optimum dose of pig slurry for nitrogen nutrition of the crops was found to be 100 m³ ha⁻¹ and was independent of the number of previous applications. Soil characteristics had a great influence on the amount of phosphorus taken up by the plants. This is due to the large amount of phosphorus added in the slurry which remained in the soil in a plant-available form. As the number of applications increased, the amount of slurry required to satisfy the phosphorus requirement of the crops decreased. Amounts of slurry within 100-150 m³ ha⁻¹ were required for adequate potassium plant nutrition. However, soil characteristics, particularly the amount of clay and thus its exchange capacity, had a significant influence on the plant potassium uptake.

NAL Call No.: 382-Sol2

113. Influence of population densities on growth and reproduction of the earthworm *Eisenia andrei* on pig manure. Reeh, U.

Soil-Biol-Biochem v.24, p.1327-1331. (1992).

In the special issue ISEE 4. Proceedings of the "4th International Symposium on Earthworm Ecology", June 11-15, 1990, Avignon, France / edited by A. Kretzschmar.

Descriptor: eisenia-; earthworms-; population-density; pig-manure; ingestion-; growth-; size-; biomass-; reproduction-; intraspecific-competition; population-dynamics

Abstract: The development of groups of 3, 6 or 12 individuals of the earthworm *Eisenia andrei* fed with fresh solid pig manure was studied in 1 litre vol. The resulting populations were described in numbers and biomasses by cocoon production, different size classes and fertility stage during a period of 230 days. The total number of clitellate worms and cocoon production reached their summit after ca 175 days, with worms from the F1 generation becoming clitellate for a period of 100 mg, originating from both smaller slow-growing worms and degenerating clitellate worms. The relative growth was related to time in an exponential decreasing way and the conversion ratio was decreasing from 10 to 4% during the growth period. At the peak of the first generation the worms were ingesting about their own weight every day, but soon they were only ingesting their own weight once every week.

NAL Call No.: S592.7.A1S6

114. The influence of surface and sub-surface application methods for pig slurry on herbage yields and nitrogen recovery.

Rees, Y. J.; Pain, B. F.; Phillips, V. R.; Misselbrook, T. H.

Grass-forage-sci v.48, p.38-44. (1993).

Includes references.

Descriptor: grasslands-; pig-slurry; application-to-land;
soil-injection; subsurface-application; application-methods;
nitrogen-cycle; recovery-; crop- yield; herbage-;
organic-amendments; organic-fertilizers; nitrogen-fertilizers;
uk-; soil-surface-application

NAL Call No.: 60.19-B773

115. Integrated hog farming and market gardening for small farmers in tropical areas of the western region.

Fleming, K.

Sustainable Agriculture Research and Education SARE or Agriculture in Concert with the Environment ACE research projects. [1988-. 1993. [6] 9 p.

SARE Project Number: LWE 92-2. Reporting period for this report is October 1992 to September 1993.

Descriptor: pig-farming; composting-; agricultural-wastes; market-gardens; tree-fruits; sustainability-; economic-analysis; small-farms; demonstration- farms; tropics-; hawaii-

NAL Call No.: S441.S855

116. Intensification and ecological aspects of methane fermentation of agricultural wastes.

Beker, M. J.; Grinbergs, A. P.; Davids, V. E.; Labane, L. J.; Blumbergs, J. E.; Marauska, M. K.

Stud-Environ-Sci p.287-296. (1991).

In the series analytic: Environmental biotechnology / edited by A. Blazej and V. Privarova. Proceedings of the International Symposium on Biotechnology, June 27-29, 1990, Bratislava, Czechoslovakia.

Descriptor: pig-slurry; anaerobic-digestion; methane-production; biogas-; crop-residues; agricultural-wastes

NAL Call No.: QH540.S8

117. Isolation of hydrolytic bacteria from biogas digesters.

Siman'kova, M. V.; Nozhevnikova, A. N.

Appl-Biochem-Microbiol v.27, p.179-183. (1991).

Translated from: Prikladnaia Biokhimiia i Mikrobiologiia, v. 27 (2), 1991, p. 228-234. (385 P93).

Descriptor: cattle-manure; pig-manure; sewage-sludge; bacteria-; hydrolysis-; methane-production; methanobacteriaceae-; microbial-degradation; organic-wastes; waste-disposal; anaerobic-digesters

NAL Call No.: QH345.A1P73

118. ISU research finds higher nutrient values in manure.

Carver, N.

Inside-Edge v.3, p.2. (1993).

Descriptor: pig-manure; nutritive-value; fertilizers-; agricultural-research; iowa-

NAL Call No.: S561.6.I8I572

119. A laboratory study of struvite precipitation after anaerobic digestion of piggery wastes.

Wrigley, T. J.; Webb, K. M.; Venkitachalm, H.

Bioresource-Technol v.41, p.117-121. (1992).

Includes references.

Descriptor: piggery-effluent; anaerobic-digestion; chemical-precipitation; slow-release-fertilizers; biogas-; methane-production

NAL Call No.: TD930.A32

120. Lagoon management.

Safley, L. M. Jr.; Fulhage, C. D.; Huhnke, R. L.; Jones, D. D.

Ext-tech-bull. [Fayetteville, Ark.?] : UA Cooperative Extension Service, [1988-. Apr 1994. (E-1341) 8 p.

In subseries: manure management.

Descriptor: pig-manure; lagoons-; waste-disposal; management-; terminology-

NAL Call No.: S561.6.A82E96

121. Lagoon management.

Safley, L. M. Jr.; Fulhage, C. D.; Huhnke, R. L.; Jones, D. D.

Pork industry handbook. West Lafayette, Ind. : Cooperative

Extension Service, Purdue University, [1978?-1990].. 8 p.

In subseries: Manure Management (PIH-62), revised June 1993.

Descriptor: lagoons-; pig-manure; waste-treatment; design-; construction-; sludges-; application-to-land

NAL Call No.: SF395.P62

122. A land-limited and energy-saving treatment system for dilute swine wastewater.

Yang, P. Y.; Chen, H.

Metab-clin-exp. Philadelphia, Pa. : W.B. Saunders Co. 1994. v. 49 (2) p. 129-137.

Includes references.

Descriptor: pig-slurry; piggery-effluent; waste-water; waste-water-treatment; biological-treatment; anaerobic-digestion; biological-fixed-film-systems; salvinia-molesta; ponds-

NAL Call No.: 448.8-M56

123. A land limited and energy saving treatment system for dilute swine wastewater.

Yang, P. Y.; Chen, H.

Pap-Am-Soc-Agric-Eng. St. Joseph, Mich. : American Society of Agricultural Engineers, . Summer 1993. (934038) 16 p.

Paper presented at the "1993 International Summer Meeting sponsored by The American Society of Agricultural Engineers," and The Canadian Society of Agricultural Engineering," June 20-23, 1993, Spokane, Washington.

Descriptor: animal-wastes; waste-water; anaerobic-treatment; tropical-climate; land-

NAL Call No.: 290.9-Am32P

124. Legal guidelines for swine manure management.
Geyer, L. L.; Findley, M.

Ext-bull-Coop-Ext-Serv, -Mich-State-Univ. East Lansing : Michigan State University, Cooperative Extension Service, . Apr 1994. (E-1160) 4 p.

In the subseries: Pork Industry Handbook: Manure Management.
Descriptor: pig-manure; regulations-; environmental-legislation; water-pollution; odor-emission; livestock-enterprises; permits-; legal-liability; legal- systems; clean-water-act; clean-air-act; best-management-practices; runoff-control-systems; cost-sharing; nuisance-; lawsuits-

NAL Call No.: 275.29-M58B

125. Legal guidelines for swine manure management.
Geyer, L. L.; Findley, M.

Pork industry handbook -- p.1-4. (1993).

Descriptor: pigs-; pig-manure; regulations-; environmental-legislation; legal-liability; nuisance-

NAL Call No.: SF395.P62

126. Loss of nitrogen during sprinkler irrigation of swine lagoon liquid.
Safley, L. M. Jr.; Barker, J. C.; Westerman, P. W.

Bioresource-Technol v.40, p.7-15. (1992).

Includes references.

Descriptor: fertigation-; sprinkler-irrigation; pig-slurry; anaerobic-treatment; lagoons-; nitrogen-; losses-; application-rates

NAL Call No.: TD930.A32

127. Loss of nitrogenous compounds during composting of animal wastes.
Martins, O.; Dewes, T.

Bioresource-Technol v.42, p.103-111. (1992).

Includes references.

Descriptor: composting-; mixtures-; chopping-; straw-; liquid-manures; poultry-manure; pig-manure; cattle-manure; nitrogen-; losses-; leachates-; gases-; emission-; ph-; nitrogen-balance

NAL Call No.: TD930.A32

128. Low temperature digestion of dairy and swine manure.
Safley, L. M. Jr.

Pap-Am-Soc-Agric-Eng. St. Joseph, Mich. : American Society of Agricultural Engineers, . Winter 1992. (92-6589/92-6618) 17 p.
Paper presented at the "1992 International Winter Meeting of the American Society of Agricultural Engineers," December 15-18, 1992, Nashville, Tennessee.

Descriptor: cattle-manure; pig-manure; methane-production; anaerobic-digestion

NAL Call No.: 290.9-Am32P

129. Low-temperature digestion of dairy and swine manure.
Safley, L. M. Jr.; Westerman, P. W.

Bioresour-technol. Barking, Essex, England : Elsevier Applied
Science ; New York, NY : Elsevier Science Publishing Co., 1991-
1994. v. 47 (2) p. 165-171.

Includes references.

Descriptor: cattle-manure; dairy-cattle; pig-manure;
anaerobic-digestion; methane-production; temperature-

NAL Call No.: TD930.A32

130. Manure and fertilizer effects on alfalfa plant nitrogen
and soil nitrogen.

Schmitt, M. A.; Sheaffer, C. C.; Randall, G. W.

J-prod-agric v.7, p.104-109. (1994).

Includes references.

Descriptor: medicago-sativa; pig-manure; cattle-manure;
phosphorus-fertilizers; potassium-fertilizers; application-rates;
preplanting-treatment; herbage-; roots-; plant-composition;
nitrogen-; nitrogen-content; nitrate-nitrogen; soil-;
seasonal-fluctuations; losses-from-soil; removal-;
nitrogen-cycle; water-pollution; risk-; minnesota-;
herbage-nitrogen-removal

NAL Call No.: S539.5.J68

131. Manure management : practices for the Minnesota pork
industry.

Schmidt, D.; Jacobson, L.; Minnesota Extension Service.

St. Paul, MN : Minnesota Extension Service, University of
Minnesota, c1994. 32 p. : ill..

Cover title.

Descriptors: Agricultural-wastes-Environmental-aspects-Minnesota;
Swine-Manure-Handling-Minnesota;

Farm-manure-Environmental-aspects- Minnesota

NAL Call No.: TD930.S35--1994

132. Manure management survey summary: Minnesota pork
producers.

Schmidt, D. R.; Jacobson, L. D.; Clanton, C. J.; Goodrich, P. R.;
Schmitt, M. A.; Lazarus, W. F.

Pap-Am-Soc-Agric-Eng. St. Joseph, Mich. : American Society of
Agricultural Engineers, . Winter 1993. (93-4545/93-4579) 10 p.
Paper presented at the "1993 International Winter Meeting
sponsored by the American Society of Agricultural Engineers,"
December 14- 17, 1993, Chicago, Illinois.

Descriptor: pig-manure; management-; regional-surveys; minnesota-

NAL Call No.: 290.9-Am32P

133. Membrane separation of raw and anaerobically digested
pig manure.

Bilstad, T.; Madland, M.; Espedal, E.; Hanssen, P. H.

Water-sci-technol v.25, p.19-26. (1992).

In the series analytic: Mexico technology in wastewater management / edited by O.O. Hart and C.A. Buckley. Proceedings of the International Specialized Conference, March 2-5, 1992, Cape Town, South Africa.

Descriptor: pig-manure; waste-treatment; anaerobic-digestion; membranes-; separation-; reverse-osmosis; organic-fertilizers; nutrients-; norway-

NAL Call No.: TD420.A1P7

134. Methods for evaluating odor from swine manure.

Riskowski, G. L.; Chang, A. C.; Steinberg, M. P.; Day, D. L.

Appl-Eng-Agric v.7, p.248-253. (1991).

Includes references.

Descriptor: pig-manure; odor-emission; odors-; evaluation-
Abstract: Two odor evaluation methods were tested during a 12-week dynamic experiment on the effects of a commercial additive on swine manure in anaerobic storage. One method was a rating method which combined many of the best features of past research methods. The other method was a ranking method which was designed to limit the effects of odor fatigue. Manure was collected daily from growing-finishing pigs and added to barrels at a rate corresponding to the volume of manure that would fall on the barrel area in a typical swine pit. Odors were analyzed weekly by human sniffers and detector tubes were used to measure ammonia, amines, and hydrogen sulfide. The manure was also analyzed for total solids content. Results showed that the magnitude estimation rating method could distinguish between odor levels when there was a significant difference in odor levels. The ranking method distinguished a difference between the highest treatment level and untreated manure which may indicate that it is a more precise method but was of limited use on its own because it did not give the magnitude of the difference.

NAL Call No.: S671.A66

135. Microbiological aspects of ammonia oxidation of swine waste.

St Arnaud, S.; Bisailon, J. G.; Beaudet, R.

Can-J-Microbiol v.37, p.918-923. (1991).

Includes references.

Descriptor: pig-manure; ammonia-; oxidation-; nitrosomonas-; nitrosomonas-europaea

NAL Call No.: 448.8-C162

136. Microbiological aspects of anaerobic digestion of swine slurry in upflow fixed-bed digesters with different packing materials.

Sorlini, C.; Ranalli, G.; Merlo, S.

Biol-Wastes v.31, p.231-239. (1990).

Includes references.

Descriptor: pig-slurry; waste-treatment; anaerobic-digestion; biodegradation-; bacteria-; anaerobic-digestion; biogas-; methane-production; media-matrices

NAL Call No.: TD930.A32

137. Modeling the effects of swine diet formulation on nitrogen waste production.

Turner, L. W.; Bridges, T. C.; Usry, J. L.

Pap-Am-Soc-Agric-Eng. St. Joseph, Mich. : American Society of Agricultural Engineers, . Summer 1992. (927038) 10 p.

Paper presented at the "1992 International Summer Meeting sponsored by the American Society of Agricultural Engineers," June 21-24, 1992, Charlotte, North Carolina.

Descriptor: animal-feeding; environment-; pollution-; nitrogen-; waste-disposal; pigs-

NAL Call No.: 290.9-Am32P

138. Modelling the performance of a non-steady state continuous aeration plant for the treatment of pig slurry.

Burton, C. H.

J-agric-eng-res v.59, p.253-262. (1994).

Includes references.

Descriptor: pig-slurry; waste-treatment; aeration-; chemical-oxygen-demand; mathematical-models

NAL Call No.: 58.8-J82

139. New industrially produced biogas technology for developing countries.

Zubr, J.

Energy-Sources v.15, p.135-143. (1993).

Includes references.

Descriptor: pig-slurry; cattle-slurry; plants-; biogas-; gas-production; bioreactors-; fermentation-; anaerobic-treatment; industrial-applications; developing-countries; sichuan-; denmark-; methanogenic-fermentation

NAL Call No.: QC73.6.E5

140. A new process to treat strong biological waste.

Henry, D. P.; Thomson, R. H.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.27, p.213-218. (1993).

In the series analytic: Appropriate waste management technologies / edited by G. Ho and K. Mathew. Proceedings of the International Conference, held November 27-28, 1991, Perth, Australia.

Descriptor: brewery-effluent; waste-treatment; pig-slurry; fermentation-; organic-acids; yeasts-

NAL Call No.: TD420.A1P7

141. Nitrification and denitrification in an activated-sludge system for supernatant from settled sow manure with molasses as an extra carbon source.

Have, P. J. W. t.; Willers, H. C.; Derikx, P. J. L.

Bioresour-technol. Barking, Essex, England : Elsevier Applied Science ; New York, NY : Elsevier Science Publishing Co., 1991-.

1994. v. 47 (2) p. 135-141.

Includes references.

Descriptor: pig-manure; sows-; deposition-; molasses-; mixtures-; activated-sludge; bioreactors-; nitrification-; denitrification-; ratios-; carbon-source

NAL Call No.: TD930.A32

142. Nitrification, denitrification and biological phosphate removal in sequencing batch reactors treating piggery wastewater. Bortone, G.; Gemelli, S.; Tambaldi, A.; Tilche, A.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.26, p.977-985. (1992).

In the series analytic: Water Quality International '92. Part 3 / edited by M. Suzuki, et al. Proceedings of the Sixteenth Biennial Conference of the International Association on Water Pollution Research and Control, held May 24-30, 1992, Washington, D.C.

Descriptor: piggery-effluent; treatment-; bioreactors-; nitrification-; denitrification-; phosphates-; italy-; phosphate-removal

NAL Call No.: TD420.A1P7

143. Nitrification/denitrification in an intermittent aeration process for swine wastewater.

Liao, C. M.; Maekawa, T.

J-environ-sci-health, -Part-B, -Pestic-food-contam-agric-wastes. New York, Marcel Dekker. 1994. v. B29 (5) p. 1053-1078.

Includes references.

Descriptor: pig-slurry; waste-water-treatment; aerobic-treatment; nitrification-; denitrification-

NAL Call No.: TD172.J61

144. Nitrite plus nitrate recoveries in piggery slurry by direct distillation and modified Kjeldahl methods.

Dimmock, S. J.; Martinez, J.

Bioresour-technol. Barking, Essex, England : Elsevier Applied Science ; New York, NY : Elsevier Science Publishing Co., 1991-. 1994. v. 48 (1) p. 21-24.

Includes references.

Descriptor: piggery-effluent; treatment-; aerobic-treatment; nitrites-; nitrates-; recovery-; distillation-; kjeldahl-method; nitrogen-content; organic- fertilizers

NAL Call No.: TD930.A32

145. Nitrogen and phosphorus forms in soils receiving manure. Sharpley, A. N.; Smith, S. J.

Soil-sci v.159, p.253-258. (1995).

Includes references.

Descriptor: agricultural-soils; pig-slurry; poultry-manure; cattle-manure; application-to-land; application-rates; nitrogen-; phosphorus-; nutrient- availability; inorganic-compounds; organic-compounds; movement-in-soil; losses-from-soil; land-productivity; long-term-experiments; oklahoma-; texas-

NAL Call No.: 56.8-So3

146. Nitrogen efficiency of autumn, winter and spring

applications of organic manures on winter cereals and its effect on grain yield and quality.

Hayward, C. F.; Jackson, D. R.; Smith, K. A.

Asp-appl-biol. Wellesbourne, Warwick : The Association of Applied Biologists. 1993. v. 36 p. 301-310.

In the series analytic: Cereal quality III / edited by P.S. Kettlewell, J.K. Gorstang, C.M. Duffus, N. Magan, W.T.B. Thomas and N.D. Paveley.

Descriptor: triticum-aestivum; winter-wheat; hordeum-vulgare; cattle-slurry; pig-slurry; animal-manures; application-date; autumn-; spring-; crop- yield; crop-quality; protein-content; seeds-

NAL Call No.: QH301.A76

147. Nitrogen leaching losses from pig slurry applied to a shallow soils.

Pandey, S. P.; Cameron, K. C.; Dakers, A. J.

Bioresource-Technol. . 1992. v. 41 (3) p. 251-258.

Includes references.

Descriptor: pig-slurry; application-to-land; lysimeters-; leachates-; nitrogen-; losses-; ammonium-nitrogen; nitrogen-; new-zealand

NAL Call No.: TD930.A32

148. Nitrogen transformations in calcareous soils amended with pig slurry under aerobic incubation.

Bernal, M. P.; Roig, A.

J-Agric-Sci v.120, p.89-97. (1993).

Includes references.

Descriptor: pig-slurry; soil-amendments; mineralization-; nitrification-; waste-disposal; aerobic-treatment; calcareous-soils; spain-

NAL Call No.: 10-J822

149. A note on the effect of deep-litter housing on growth performance of growing-finishing pigs.

Matte, J. J.

Can-j-anim-sci v.73, p.643-647. (1993).

Includes references.

Descriptor: pigs-; deep-litter-housing; growth-rate; manures-; enzymes-; ventilation-; temperature-

NAL Call No.: 41.8-C163

150. Nutrient balances in calcareous soils after application of different rates of pig slurry.

Bernal, M. P.; Roig, A.; Garcia, D.

Soil-use-manage v.9, p.9-14. (1993).

Includes references.

Descriptor: capsicum-annuum; calcareous-soils; pig-slurry; waste-utilization; application-to-land; application-rates; nitrogen-; potassium-; phosphorus-; iron-; manganese-; zinc-; copper-; nutrient-content; nitrogen-content;

nutrient-availability; nutrient-uptake; nutrient-retention;
losses-from-soil; fixation-; soil-organic-matter; soil-ph;
clay-fraction; cation-exchange

Abstract: Changes in amounts of macro- (N, P, K) and
micro-nutrients (Fe, Mn, Zn and Cu) were determined in two
calcareous sods amended over an eight-month period with pig
slurry applications ranging from 0 to 500 m³/ha, and planted in
containers with green pepper (*Capsicum annuum*). Total N and
exchangeable K increased after slurry applications of 300 m³/ha
or more, and available P increased after the smallest
application rate (100 m³/ha). Maximum crop nutrient uptakes of
41, 40 and 91% for N, P and K occurred with the smallest dose of
slurry. Large losses of N, ranging from 27 to 74% (mean 55%) of
N added to soil, occurred with all slurry treatments. From 41 to
71% (mean 55%) of the total P added in pig slurry was fixed in
nonassimilable forms. Most of the K from the pig slurry was
available to the plants. Most of the micro-nutrients (Fe, Mn, Zn
and Cu) from the slurry were immobilized in the soil, probably
because of the high pH and the small amounts of organic matter
in both the slurries and soils tested.

NAL Call No.: S590.S68

151. Observations on an outbreak of anthrax in pigs in north
Wales.

Williams, D. R.; Rees, G. B.; Rogers, M. E.

Vet-Rec-J-Br-Vet-Assoc v.131, p.363-366. (1992).

Includes references.

Descriptor: pigs-; anthrax-; public-health; risk-; pig-slurry;
disposal-; disinfection-; legislation-; history-;
disease-control; wales-

NAL Call No.: 41.8-V641

152. Observations on the life history of *Onthophagus*
medorensis.

Hunter, J. S. I.; Fincher, G. T.; Lancaster, J. L. Jr.

Southwest-Entomol v.16, p.205-213. (1991).

Includes references.

Descriptor: onthophagus-; cattle-dung; pig-manure; life-history;
oviposition-; biological-development; pitfall-traps; surveys-;
habitats-; morphology-; arkansas-; texas-

NAL Call No.: QL461.S65

153. Odor control in liquid hog manure by added amendments
and aeration.

Al Kanani, T.; Akochi, E.; MacKenzie, A. F.; Alli, I.;
Barrington, S.

J-Environ-Qual v.21, p.704-708. (1992).

Includes references.

Descriptor: pig-manure; liquid-manures; odors-; odor-abatement;
odor-emission; aeration-; sphagnum-; mosses-; calcium-phosphates;
sulfates-; phosphates-; sulfur-; carbon-; carbonate-;
calcium-oxide; monocalcium-phosphate-monohydrate;
hydrogen-sulfate; hydrogen-phosphate

Abstract: A reduction in the emission of malodorous gases from

liquid hog manure (LHM) would represent an advantage for LHM use in agricultural systems. Procedures for the reduction of disagreeable odors during storage of LHM (*Sus scrofa domesticus*) were studied in the laboratory. Sphagnum peat moss (Sphagnum moss species), 1.5 M H₂SO₄, 1.7 M H₃PO₄, monocalcium phosphate monohydrate (MCPM), elemental S, CaCO₃, and CaO were used to reduce odors. Amended and nonamended LHM was incubated with and without aeration for periods ranging from 2 to 720 h at 23 +/- 0.4 degrees C. Odor measurements of emitted air were carried out using a sensory panel. Gas chromatography-mass spectrometry (GC-MS) was used to identify specific odor-producing compounds. The GC-MS analysis revealed that added Sphagnum moss (SM) prevented the release of 1,2-ethanediamine, N-methyl methanamine, 3-methyl 2-butanamine, methyl hydrazine, ethanethioic acid, and methanethiol from LHM. Aeration as a treatment, in general, resulted in a greater reduction of odor presence and offensiveness than nonaeration. In nonaerated LHM treatments, SM at levels of 4 or 8% (w/w) or a combined treatment of 2% CaCO₃ plus 1% SM resulted in a significant reduction in odor presence and offensiveness. Little odor reduction was observed with H₂SO₄, H₃PO₄, MCPM, and CaO, and no odor reduction was found with elemental S.

NAL Call No.: QH540.J6

154. Olfactometric characterization of odour generation potential of pigery manure samples.

Wassenhove, F. v.; Vanrolleghem, P.; Langenhove, H. v.; Verstraete, W.

Stud-Environ-Sci p.425-430. (1992).

In the series analytic: Biotechniques for air pollution abatement and odour control policies / edited by A.J. Dragt and J. van Ham. Proceedings of an International Symposium, October 27-29, 1991, Maastricht, The Netherlands.

Descriptor: pig-manure; odors-; air-pollution; odor-emission; pig-housing; olfactometers-

NAL Call No.: QH540.S8

155. Organic and inorganic amendments to reduce ammonia losses from liquid hog manure.

Al Kanani, T.; Akochi, E.; MacKenzie, A. F.; Alli, I.; Barrington, S.

J-Environ-Qual v.21, p.709-715. (1992).

Includes references.

Descriptor: hordeum-vulgare; pig-manure; liquid-manures; ammonium-nitrogen; volatilization-; losses-from-soil; nitrogen-; mosses-; sulfuric-acid; phosphoric-acid; calcium-phosphates; sulfur-; calcium-carbonate; ph-; incubation-duration; nitrogen-content; nutrient-availability; dry-matter; crop-yield; sphagnum-; monocalcium-phosphate-monohydrate

Abstract: Liquid hog manure (*Sus scrofa domesticus*) is in common use as a fertilizer or a soil conditioner in agricultural production. Liquid hog manure (LHM) suffers from N loss through volatilization of ammonia (NH₃), however. Reduction of NH₃ loss from 4% total solids LHM was studied using added Sphagnum peat moss (*Sphagnum fuscum* peat), sulfuric acid, phosphoric acid,

monocalcium phosphate monohydrate (MCPM), elemental S, and calcium carbonate. Cumulative losses of NH₃-N ranged between 0 and 711 mg N kg⁻¹ LHM applied. Elemental Sulfur and calcium carbonate (CaCO₃) treatments induced greater NH₃ losses compared with the nonamended LHM, whereas acidic treatments including Sphagnum peat moss (SM) reduced NH₃ losses by at least 74.6%. Volatilization of NH₃ from LHM increased as the pH of amended LHM treatment increased. The relationships between cumulative (15 d) NH₃ volatilized and initial pH of amended LHM varied, depending on the amendment. The nutrient values of amended LHM stored for 25 d under continuous aeration were assessed on two soils mapped as Chicot (fine loamy, mixed, nonacid, mesic Typic Hapludoll) and Uplands (coarse loamy, mixed, nonacid, Typic Haplorthod) from eastern Canada. Treatment of LHM with SM at greater than 1% (w/w) reduced NH₃ volatilization. Added CaCO₃ increased NH₃ loss. In general, amendments did not reduce effectiveness of LHM-N for barley (*Hordeum vulgare* L.) growth. An exception was the 1% SM + 2% CaCO₃ amendment that reduced plant growth.

NAL Call No.: QH540.J6

156. Organic and inorganic fertilizer effects on runoff quality.

Edwards, D. R.; Daniel, T. C.

Ark-farm-res v.43, p.4-5. (1994).

Includes references.

Descriptor: runoff-water; water-quality; poultry-manure; pig-manure; fertilizers-; inorganic-compounds; festuca-arundinacea; arkansas-

NAL Call No.: 100-Ar42F

157. Performance of a modified anaerobic baffled reactor to treat swine waste.

Boopathy, R.; Sievers, D. M.

Trans-A-S-A-E v.34, p.2573-2578. (1991).

Includes references.

Descriptor: pig-manure; anaerobic-digesters; methane-production; methodology-; particles-; waste-disposal

Abstract: Two laboratory scale, anaerobic baffled reactors (one with two chambers, a second with three chambers) were used to successfully treat whole swine manure. COD reductions were 69% and 62%, respectively, with maximum methane production of 0.45 and 0.50 L/g VS added at a loading of 4 g VS/L.d. The baffled chambers did an excellent job of trapping the small diameter, methane containing particles of proteins, cellulose, hemicellulose and lipids. Solids retention times of 22 and 25 days were achieved with a corresponding hydraulic retention of 15 days.

NAL Call No.: 290.9-AM32T

158. Persistence of inoculated hepatitis A virus in mixed human and animal wastes.

Deng, M. Y.; Cliver, D. O.

Appl-environ-microbiol v.61, p.87-91. (1995).

Includes references.

Descriptor: hepatitis-a-virus; survival-; inactivation-;
pig-slurry; septic-tank-effluent; mixtures-; risk-;
application-to-land

Abstract: The persistence of hepatitis A virus (HAV) was determined both in mixtures of septic tank effluent (STE) with dairy cattle manure slurry (DCMS) and in mixtures of STE with swine manure slurry (SMS). HAV was consistently inactivated more rapidly in the two types of mixed wastes than in STE alone or in the control Dulbecco's phosphate-buffered saline (PBS). At 5 degrees C, the D values (time, in days, for a 90% reduction of virus titer) were 34.6 for the mixed STE and DCMS, 48.5 for the mixed STE and SMS, 58.5 for STE, and 217.4 for the Dulbecco's PBS control. At 22 degrees C, the D values were 23.0, 17.1, 35.1, and 90.1 for the four suspension media, respectively. A comparison of HAV inactivation in mixed wastes subjected to different treatments at the same pH and temperatures showed that the virus inactivation in the mixed wastes was related, at least in part, to microbial activity. In mixed STE and DCMS, the D values at 25 degrees C were 8.3 for raw mixed wastes, 15.1 for autoclaved mixed wastes, and 9.6 for bacterium-free filtrate of raw mixed wastes; D values at 37 degrees C were 6.8, 10.1, and 7.0 for these three suspension media, respectively. In mixed STE and SMS, the D values at 25 degrees C were 8.1 for raw mixed wastes, 14.3 for autoclaved mixed wastes, and 9.1 for bacterium-free filtrate of raw mixed wastes; the D values at 37 degrees C were 6.8, 9.4, and 6.9 for the three suspensions, respectively.

NAL Call No.: 448.3-Ap5

159. Phosphorus forms in animal manure.
Barnett, G. M.

Metab-clin-exp. Philadelphia, Pa. : W.B. Saunders Co. 1994. v. 49
(2) p. 139-147.

Includes references.

Descriptor: cattle-; cattle-dung; dairy-cattle; beef-cattle;
poultry-droppings; feces-; pigs-; phosphorus-;
inorganic-phosphorus; organophosphorus- compounds; calf-feeding;
phleum-pratense; phalaris-arundinacea; forage-

NAL Call No.: 448.8-M56

160. Phosphorus leaching in soils amended with piggery effluent or lime residues from effluent treatment.
Weaver, D. M.; Ritchie, G. S. P.

Environ-pollut v.84, p.227-235. (1994).

Includes references.

Descriptor: piggery-effluent; leaching-; phosphorus-; lime-;
liming-; sorption-; sandy-soils; nutrient-retention;
water-pollution; eutrophication-

NAL Call No.: QH545.A1E52

161. Phosphorus removal from piggery effluents of varying quality using lime and physico-chemical treatment methods.
Weaver, D. M.; Ritchie, G. S. P.

Environ-pollut v.84, p.237-244. (1994).

Includes references.

Descriptor: piggery-effluent; phosphorus-; removal-; lime-; waste-treatment; pollution-control

NAL Call No.: QH545.A1E52

162. Physico-chemical properties and productivity of two tropical soils amended with dehydrated swine waste.

Mbaguwu, J. S. C.; Unamba Oparah, I.; Nevoh, G. O.

Metab-clin-exp. Philadelphia, Pa. : W.B. Saunders Co. 1994. v. 49 (2) p. 163-171.

Includes references.

Descriptor: pig-manure; dehydration-; application-rates; zea-mays; dry-matter-accumulation; seed-germination; tropical-soils; sandy-soils; clay-soils; soil-chemistry; exchangeable-cations; soil-ph; soil-organic-matter; soil-water; nutrient-content; nutrient-availability; nigeria-

NAL Call No.: 448.8-M56

163. Use of bark filters for biological slurry treatment.

Schalk, -Peter.

Freiburger bodenkundliche Abhandlungen ; 0344-2691 ; Heft 32.

Freiburg im Breisgau : Im Selbstverlag des Instituts fur Bodenkunde und Waldernahrungslehre, 1993. 131 p. : ill.

LA: German; Summary in: English, French, Spanish

DE: Swine-Housing-Waste-disposal. Swine-Manure-Handling.

Trickling-filters. Bark-

NAL Call No.: TD930.S33--1993

164. Pig slurry and cow manure effect on atrazine and metolachlor soil biodegradation in maize.

Rouchaud, J.; Gustin, F.; Cappelen, O.; Mouraux, D.

Bull-environ-contam-toxicol v.52, p.568-573. (1994).

Includes references.

Descriptor: zea-mays; metolachlor-; atrazine-; pig-slurry; cattle-manure; herbicide-residues; persistence-

NAL Call No.: RA1270.P35A1; LNSU RA1270.P35A1

165. Pig-slurry composts as wheat fertilizers.

Gonzalez, J. L.; Benitez, I. C.; Perez, M. I.; Medina, M.

Bioresource-Technol v.40, p.125-130. (1992).

Includes references.

Descriptor: triticum-aestivum; pig-slurry; composts-; plant-analysis; crop-yield; spain-

NAL Call No.: TD930.A32

166. Pig waste management and recycling : the Singapore experience.

Taiganides, E. P. E. P. 1.; International Development Research Centre (Canada.).

Ottawa : International Development Research Centre, 1992. xiii,

368 p. : ill..

Includes index.

Descriptors: Animal-waste-Singapore; Swine-Singapore;

Animal-waste-Singapore-Management;

Animal-waste-Singapore-Recycling

NAL Call No.: TD811.T35-1992

167. Pig wastewater treatment in water hyacinth ponds.

Polprasert, C.; Kessomboon, S.; Kanjanaprapin, W.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.26,
p.2381-2384. (1992).

In the series analytic: Water Quality International '92. Part 5 /
edited by M. Suzuki, et.al. Proceedings of the Sixteenth Biennial
Conference of the International Association on Water Pollution
Research and Control held May 24-30, 1992, Washington, D.C.

Descriptor: piggery-effluent; waste-water-treatment; lagoons-;
eichhornia-crassipes; organic-loading-rate;

hydraulic-retention-time

NAL Call No.: TD420.A1P7

168. Plugging effects from livestock waste application on
infiltration and runoff.

Roberts, R. J.; Clanton, C. J.

Trans-A-S-A-E v.35, p.515-522. (1992).

Literature review.

Descriptor: infiltration-; permeability-; rain-; runoff-;
soil-water; dairy-wastes; pig-slurry; literature-reviews

Abstract: A rainfall simulator was used on repacked Waukegan silt
loam and Hubbard loamy sand soil columns to determine the
combined effect of rainfall and livestock waste application on
infiltration and runoff. Dairy and swine waste slurries were
either surface-applied or incorporated. Livestock waste
application noticeably reduced the amount of runoff during a
series of artificial rainfall events for all cases with the
exception of swine waste incorporated into the silt loam soil.
Loamy sand exhibited short-term plugging when both wastes were
surface-applied with no incorporation. Surface-application of
dairy waste on the silt loam soil apparently prevented formation
of a surface seal and improved the infiltration capacity. of the
soil. Less surface-scaling in waste-applied columns may be
attributed to increased organic matter on the surface of the
soil that aided aggregate stability. Also. the waste particles
protected the surface from the energy of the impacting raindrops.

NAL Call No.: 290.9-AM32T

169. Pollution among sewers of the pig-breeding complex.

Zagriznenie sredy stokami svinovodcheskogo kompleksa.

Karps, A. E.; Biolo'gijas instituts (Latvijas PSR Zinatnu
akademija).

Riga : Zinatne, 1990. 237 p. : ill..

Summary in English.

Descriptors: Animal-waste-Latvia;

Agricultural-wastes-Environmental-aspects-Latvia;

Swine-Housing-Latvia-Waste-disposal

NAL Call No.: TD930.Z33-1990

170. Potential of biological and chemical control of bacterial wilt.

Hartman, G. L.; Hong, W. F.; Hanudin.; Hayward, A. C.

ACIAR-proc p.322-326. (1993).

In the series analytic: Bacterial wilt / edited by G.L. Hartman and A.C. Hayward.

Descriptor: lycopersicon-esculentum; pseudomonas-solanacearum; wilts-; plant-disease-control; biological-competition; rhizosphere-; microbial- pesticides; pseudomonas-gladioli; pseudomonas-cepacia; pseudomonas-fluorescens; soil-inoculation; bactericides-; green-manures; crotalaria-; pig-slurry; inorganic-salts; terlai-

NAL Call No.: S542.A8A34

171. Prevalence of npt II and Tn5 in kanamycin-resistant bacteria from different environments.

Smalla, K.; Van Overbeek, L. S.; Pukall, R.; Van Elsas, J. D.

FEMS-microbiol-ecol v.13, p.47-58. (1993).

Includes references.

Descriptor: agricultural-soils; pig-slurry; river-water; sewage-; bacteria-; kanamycin-; drug-resistance; transposable-elements; dna-; population- density

Abstract: Kanamycin (Km)-resistant bacterial populations in different soil, river water, sewage and pig manure slurry samples were enumerated and their prevalence in the total populations determined. About 350 Km-resistant Gram-negative colonies grown in the presence of kanamycin were identified using a rapid presumptive identification scheme. They were then screened for the presence of Tn5 and nptII sequences using hybridizations of cells in dot blots, of Southern-blotted genomic DNA extracts and of PCR amplification products. Colonies reacting positively with a 2.7 kb probe of the central region of Tn5, or with a 925 bp nptII specific probe were primarily obtained from sewage samples, whereas fewer were obtained from pig manure slurry, river water and soil. However, in soil samples bacteria containing Tn5 or nptII were not found. Transposon Tn5 carrying the nptII gene could be unequivocally demonstrated in 3 isolates from sewage, identified as *Aeromonas* spp. (2x) and *Escherichia coli*. HindIII digests of chromosomal DNA obtained from these strains were cloned and shown to confer Km resistance to a sensitive *E. coli* strain. Further, various strains revealed the presence of nptII homologous sequences in a non-Tn5 background. The occurrence of Tn5 and nptII in the samples was also assessed via PCR analysis of total community DNA extracts obtained from the aforementioned environmental samples. Evidence for the occurrence of nptII was obtained for sewage, pig manure slurry, for 2 (out of 3) river water (Avon, Rhine). environmental DNA extracts but it was found in Ede loamy sand and Flevo silt loam samples taken from a field microplot 2 and 4 weeks after release of a Tn5-containing genetically modified organism.

NAL Call No.: QR100.F45

172. Production of Schizosaccharomyces sp. HL biomass from supernatant of anaerobically fermented pig waste.
Hong, S. S.; Lee, N. H.; Pack, M. Y.

Process-Biochem v.26, p.23-29. (1991).

Includes references.

Descriptor: yeasts-; biomass-production; pig-slurry;
anaerobic-conditions; fermentation-; culture-media;
volatile-fatty-acids; assimilation-; ph-; dry-
matter-accumulation; microbial-contamination; inhibition-;
heat-treatment; chemical-analysis; amino-acids;
nutritional-assessment; minerals-; vitamins-;
biological-oxygen-demand; chemical-oxygen-demand; growth-;
surface-cultures

NAL Call No.: TP1.P7

173. Recirculating aquacultural system for waste treatment.
Dontje, J. H.; Clanton, C. J.

Pap-Am-Soc-Agric-Eng. St. Joseph, Mich. : American Society of Agricultural Engineers, . Winter 1992. (92-4529) 15 p.

Paper presented at the "1992 International Winter Meeting sponsored by the American Society of Agricultural Engineers," December 15- 18, 1992, Nashville, Tennessee.

Descriptor: pig-manure; waste-water-treatment; aquaculture-;
hydroponics-; recirculation-

NAL Call No.: 290.9-Am32P

174. Relationship between concentration and intensity of odours for pig slurry and broiler houses.

Misselbrook, T. H.; Clarkson, C. R.; Pain, B. F.

J-Agric-Eng-Res v.55, p.163-169. (1993).

Includes references.

Descriptor: pig-slurry; poultry-housing; broilers-;
odor-emission; measurement-; odor-abatement; odor-concentration;
odor-intensity

Abstract: Relationships were derived between odour concentration and odour intensity for odour emissions following land spreading of pig slurry and emissions from broiler houses. Data were obtained from trials conducted between 1987 and 1990. Odour concentration measurements were made by 50% threshold determination using a dynamic dilution olfactometer with a forced-choice type presentation to a panel of people. Odour intensity measurements were made using the same equipment and required panelists scoring their perception of the intensity of an odour at a range of concentrations according to a category scale ranging from 0 (no odour) to 6 (extremely strong odour). Intensity was related linearly to the logarithm of concentration. Significant differences ($p = 0.05$) were found between relationships derived for odours from pig slurry and odours from broiler houses. For odours from pig slurry the derived relationship was, Intensity = $1.61 (\log_{10} \text{Concentration}) + 0.45$ and for broiler house odours, Intensity = $2.35 (\log_{10} \text{Concentration}) + 0.30$ indicating higher intensity per unit concentration for the broiler house odours. These relationships could be useful in estimating the reduction in odour

concentration required to reduce the perceived intensity of the odour to acceptable levels and, when used in conjunction with dispersion models, in determining minimum acceptable distances between the odour source and potential complainants.

NAL Call No.: 58.8-J82

175. Relationship between N immobilization and volatile fatty acids in soil after application of pig and cattle slurry.
Kirchmann, H.; Lundvall, A.

Biol-Fertil-Soils v.15, p.161-164. (1993).

Includes references.

Descriptor: cattle-slurry; pig-slurry; volatile-fatty-acids; application-to-land; decomposition-; carbon-; nitrogen-; mineralization-; microorganisms-; soil-biology; butyrates-; propionates-; sweden-

NAL Call No.: QH84.8.B46

176. Remodeling ideas for farrowing facilities.
Jacobson, L. D.; Murphy, J. P.; Pohl, S. H.

Ext-bull-Coop-Ext-Serv,-Mich-State-Univ. East Lansing : Michigan State University, Cooperative Extension Service,. Apr 1994. (E-1531) 8 p.

In the subseries: Pork Industry Handbook: Housing.

Descriptor: farrowing-houses; pigs-; farrowing-pens; pig-manure; waste-disposal; artificial-ventilation; insulation-; heating-systems

NAL Call No.: 275.29-M58B

177. Remodeling ideas for farrowing facilities.
Jacobson, L. D.; Murphy, J. P.; Pohl, S. H.

Pork industry handbook -- p.1-8. (1993).

Descriptor: pigs-; farrowing-houses; design-; farrowing-pens; pig-manure; insulation-; artificial-ventilation; heating-

NAL Call No.: SF395.P62

178. Removal of nitrogen and phosphorus from swine wastewater by intermittent aeration processes.
Liao, C. M.; Maekawa, T.; Chiang, H. C.; Wu, C. F.

J-Environ-Sci-Health-Part-B-Pestic-Food-Contam-Agric-Wastes v.B28, p.335-374. (1993).

Includes references.

Descriptor: piggery-effluent; waste-water; waste-treatment; aerobic-treatment; nitrogen-; phosphorus-; biochemical-oxygen-demand; denitrification-; nitrification-; removal-efficiencies; total-organic-carbon

NAL Call No.: TD172.J61

179. Removal of Salmonella, Streptococci and coliforms in pig breeding effluent by anaerobic mesophilic digestion.
Duarte, E. A.; Mendes, B.; Oliveira, J. S.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.26, p.2169-2172. (1992).

In the series analytic: Water Quality International '92. Part 5 / edited by M. Suzuki, et.al. Proceedings of the Sixteenth Biennial Conference of the International Association on Water Pollution Research and Control held May 24-30, 1992, Washington, D.C.
Descriptor: piggery-effluent; anaerobic-digestion; bioreactors-; streptococcus-; salmonella-; removal-; methane-production; pollution-; control-; environmental-protection; biomethanization-
NAL Call No.: TD420.A1P7

180. A review of the strategies in the aerobic treatment of pig slurry: purpose, theory and method.
Burton, C. H.

J-Agric-Eng-Res v.53, p.249-272. (1992).

Includes references.

Descriptor: pig-slurry; aerobic-treatment; animal-diseases; pathogens-; disease-control; odor-abatement; nitrification-; denitrification-; costs-; reviews- ; uk-; solids-removal

Abstract: Aerobic treatment of piggery slurry can be used to tackle a range of slurry problems. Batch aeration (in particular at thermophilic temperatures) is well suited to reducing pathogen numbers, offering a cheap and simple process. For other duties, continuous treatments are more suitable. For odour control, short treatment times (1 to 2 d) are adequate if land spreading is intended within a few days. Longer treatment times (3 to 5 d) enable up to 6 weeks subsequent storage of slurry without offensive odour; removal of solids after treatment can extend this period. Nitrification can be encouraged by long treatments at a high level of aeration (i.e. dissolved oxygen concentration above 1% of saturation). The nitrogen lost to the atmosphere as ammonia is thereby reduced. Denitrification in anoxic storage will remove nitrate as nitrogen gas if nitrate leaching is a problem, but some nitrous oxide, which is a greenhouse gas, may also be produced. Depending on the extent of treatment, costs can vary between 1.60 pounds sterling and 10.50 pounds sterling per pig produced, thus representing a high proportion of the profit margin. There may be some benefits from slurry aeration resulting from the fertilizer value, possible heat extraction and easier disposal of the slurry but developments are likely to remain legislation-led, with minimum cost being the principal criterion.

NAL Call No.: 58.8-J82

181. Riparian forest buffer system research at the Coastal Plain Experiment Station, Tifton, GA.
Hubbard, R. K.; Lowrance, R. R.

Water-air-soil-pollut v.77, p.407-432. (1994).

In the special issue: Wetlands of the interior southeastern United States / edited by C.C. Trettin, W.M. Aust, and J. Wisniewski. September 28-30, 1993, Knoxville, Tennessee.

Descriptor: riparian-forests; riparian-vegetation; grasses-; vegetation-management; clearcutting-; selective-felling; wetlands-; biological-treatment; waste-water-treatment; dairy-wastes; pig-slurry; aldicarb-; insecticide-residues; nutrients-; removal-; nutrient-uptake; simulation-models; nitrate-; denitrification-; water-quality; runoff-; groundwater-;

groundwater-pollution; water-pollution; georgia-
NAL Call No.: TD172.W36

182. Runoff quality impacts of swine manure applied to fescue plots.

Edwards, D. R.; Daniel, T. C.

Trans-A-S-A-E v.36, p.81-86. (1993).

Includes references.

Descriptor: festuca-; pig-manure; runoff-; water-quality;
application-rates; rainfall-simulators; arkansas-

Abstract: Runoff concentrations of animal manure constituents are much higher for the first runoff-producing storm after land application than for subsequent storms. These concentrations are also inversely related to the interval between application and first runoff-producing storm. In terms of runoff quality, the worst situation is generally when the first runoff-producing storm occurs soon after application. This study was conducted to determine how potential first-storm runoff quality from fescue grass plots is affected by animal manure application rate and simulated rainfall intensity. Swine manure slurry was used in a factorial experimental design with three levels [0, 217, and 435 kg nitrogen (N)ha⁻¹] of slurry application rate and two levels (5 and 10 cm h⁻¹) of simulated rainfall intensity. The slurry was applied during moist soil conditions. Simulated rainfall was initiated 24 h following application. Runoff amounts and concentrations of slurry constituents (total Kjeldahl N, ammonia N, nitrate N, total phosphorus, dissolved reactive phosphorus, chemical oxygen demand, total suspended solids, and electrical conductivity) were determined. Analyses of variance were performed to assess the influences of the variables on both concentrations and event mass losses of the slurry constituents. Both runoff concentrations and event mass losses of all slurry constituents except nitrate N increased approximately linearly with application rate. Runoff concentrations of all slurry constituents except nitrate N decreased with increasing rainfall intensity, but event mass losses were unaffected.

NAL Call No.: 290.9-AM32T

183. Salinity risks on calcareous soils following pig slurry applications.

Bernal, M. P.; Roig, A.; Madrid, R.; Navarro, A. F.

Soil-Use-Manage v.8, p.125-130. (1992).

Includes references.

Descriptor: aridisols-; calcareous-soils; semiarid-climate;
pig-slurry; application-to-land; soil-degradation; soil-salinity;
application-rates; electrical-conductivity; salts-in-soil;
solubility-; leaching-; losses-from-soil; water-holding-capacity;
cation-exchange-capacity; exchangeable-cations; clay-fraction;
illite-; montmorillonite-; interstratified-minerals;
soluble-salt-accumulation

Abstract: The electrical conductivity of pig slurry suggests that addition of this waste to soils in arid and semiarid areas could cause salinization. Changes in electrical conductivity and soluble salt concentration in two calcareous soils indicated a salinity risk after 24 months of pig slurry addition at rates of

400 m³/ha/yr or more. Salinity risk increased with soil water-holding capacity. Water-soluble potassium concentrations showed a greater increase than other cations in the soils because of the large amount present in the slurry. The proportion of soluble potassium in the soil depended on the soil's cation exchange capacity and on the composition of the clay fraction.

NAL Call No.: S590.S68

184. Scraper systems for removing manure from swine facilities.

Vanderholm, D.; Melvin, S.

Publ-La-Coop-Ext-Serv. [Baton Rouge, La.?] : The Service. May 1990. (2013-K) 6 p.

In subseries: Pork Industry Handbook. Waste Management.

Descriptor: pig-manure; waste-disposal; scrapers-

NAL Call No.: S67.P82

185. Seepage and electromagnetic terrain conductivity around new swine lagoons.

Huffman, R. L.; Westerman, P. W.

Pap-Am-Soc-Agric-Eng. St. Joseph, Mich. : American Society of Agricultural Engineers, . Summer 1991. (914016) 16 p.

Paper presented at the "1991 International Summer Meeting sponsored by the American Society of Agricultural Engineers," June 23-26, 1991, Albuquerque, New Mexico.

Descriptor: lagoons-; pig-slurry; seepage-; groundwater-; water-quality; north-carolina

NAL Call No.: 290.9-Am32P

186. Simulating corn yields over 16 years on three soils under inorganic fertilizer and hog manure fertility regimes.

Parsons, R. L.; Pease, J. W.; Martens, D. C.

Commun-soil-sci-plant-anal v.26, p.1133-1150. (1995).

Includes references.

Descriptor: zea-mays; silt-loam-soils; clay-loam-soils; sandy-loam-soils; crop-yield; estimation-; simulation-models; field-experimentation; comparisons-; organic-fertilizers; pig-manure; fertilizers-; virginia-;

erosion-productivity-impact-calculator-simulation-model

Abstract: Corn yields (*Zea mays* L.) on control treatments with inorganic fertilizer and on copper-enriched hog manure treatments with annual rates up to 168 mt/ha from a 16-year study were modelled with the Erosion Productivity Impact Calculator (EPIC) simulation model. The field research study was conducted on three diverse soils, a Guemsey silt loam, a Bertie fine sandy loam, and a Starr-Dyke clay loam. Results indicated that EPIC simulated the manure and fertilizer treatments equally well. EPIC produced simulated yield means that were not different from measured yield means for all treatments (p less than or equal to 0.05). Goodness of fit tests indicate that simulated yields did not differ from measured yields for all simulation models except the Bertie manure treatment (p less than or equal to 0.05). For control and manure treatments, simulated yields explained 78% and 89% of variation in measured yields for the Guernsey soil,

55% and 42% for the Bertie soil, and 76% and 70% for the Starr-Dyke soil, respectively. Overall, these are reasonable yields estimates, but site-specific soil and other model parameter respecification is critical. Yield modeling with heavy applications of animal manure or inorganic fertilizer is feasible and useful.

NAL Call No.: S590.C63

187. Simultaneous high-biomass protein production and nutrient removal using *Spirulina maxima* in sea water supplemented with anaerobic effluents.

Olguin, E. J.; Hernandez, B.; Araus, A.; Camacho, R.; Gonzalez, R.; Ramirez, M. E.; Galicia, S.; Mercado, G.

World-j-microbiol-biotechnol v.10, p.576-578. (1994).

Includes references.

Descriptor: pig-slurry; piggery-effluent; sea-water; spirulina-; anaerobic-digestion; biomass-production; protein-content; ammonium-nitrogen; phosphates-; waste-utilization; spirulina-maxima

NAL Call No.: QR1.M562

188. Soil metabolism of the herbicide isoxaben in winter wheat crops.

Rouchaud, J.; Gustin, F.; Callens, D.; Himme, M. v.; Bulcke, R.

J-agric-food-chem v.41, p.2142-2148. (1993).

Includes references.

Descriptor: isoxaben-; herbicide-residues; microbial-degradation; metabolism-; metabolites-; soil-flora; wheat-soils; green-manures; cattle-manure; pig-slurry

Abstract: Winter wheat fields were treated with the herbicide isoxaben after sowing. Trials were made in 1990-1991 and 1991-1992. The main isoxaben soil metabolite was demethoxyisoxaben (N-[3-(1-ethyl-1-methylpropyl)isoxazol-5-yl]-2-hydroxy-6-methoxybenzamide), i.e., the monodemethoxylation product of isoxaben. 5-Isoxazolone.

NAL Call No.: 381-J8223

189. Soil mineral nitrogen arising from organic manure application.

Chambers, B. J.; Smith, K. A.

Asp-appl-biol p.135-143. (1992).

In the series analytic: Nitrate and farming systems / edited by J.R. Archer, K.W.T. Goulding, S.C. Jarvis, C.M. Knott, I. Lord, S.E. Ogilvy, J. Orson, K.A. Smith, and B. Wilson.

Descriptor: pig-slurry; cattle-slurry; farmyard-manure; poultry-manure; soil-fertility; nitrogen-; ammonium-nitrogen; leaching-; winter-; nitrate-; west-midlands-of-england

NAL Call No.: QH301.A76

190. Soil tillage effects on ammonia volatilization from surface-applied or injected animal slurry.

Sommer, S. G.; Ersboll, A. K.

J-environ-qual v.23, p.493-498. (1994).

Includes references.

Descriptor: ammonia-; losses-from-soil; volatilization-;
cattle-slurry; pig-slurry; harrowing-; air-temperature;
wind-speed; soil-water-content; soil- water-potential;
mathematical-models

Abstract: Ammonia (NH₃) losses from cattle (Bos sp.) and pig (Sus scrofa) slurry applied to a harrowed and unworked soil were studied in seven field experiments from October 1990 to December 1991. In one experiment slurry was directly injected into the soil and in six experiments slurry was surface-applied. Ammonia losses were measured with a wind tunnel system. From directly injected slurry applied to a recently harrowed soil, NH₃ losses were 30% of the losses from an unworked soil. Harrowing the soil immediately before surface application of the slurry reduced losses to less than 50% of the losses from an unworked soil. The accumulated NH₃ loss from slurry applied in the field was described with a Michaelis-Menten-like equation, showing the NH₃ loss reaction modeled adequately as a first-order reaction. The effect of treatment, soil conditions, or environmental conditions on NH₃ loss pattern from slurry applied in the field may therefore be treated statistically by comparing the parameters in the Michaelis-Menten equation.

NAL Call No.: QH540.J6

191. Struvite (MgNH₄PO₄.6H₂O) solubility and its application to a piggery effluent problem.

Webb, K. M.; Ho, G. E.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.26, p.2229-2232. (1992).

In the series analytic: Water Quality International '92. Part 5 / edited by M. Suzuki, et.al. Proceedings of the Sixteenth Biennial Conference of the International Association on Water Pollution Research and Control held May 24-30, 1992, Washington, D.C.

Descriptor: piggery-effluent; waste-water-treatment; lagoons-; chemicals-; solubility-; chemical-precipitation; western-australia

NAL Call No.: TD420.A1P7

192. Sustainable swine production in the U.S. corn belt. Honeyman, M. S.

Am-J-Alternative-Agric v.6, p.63-70. (1991).

Includes references.

Descriptor: pigs-; animal-production; sustainability-; alternative-farming; animal-husbandry; pig-feeding; feeds-; pig-manure; waste-utilization; cycling-; nutrients-; animal-housing; animal-health; animal-welfare; animal-behavior; genetic-variation; profitability-; environmental-impact; iowa-; fibrous-feeds; pasture-rearing

Abstract: Swine production is a major component of Corn Belt agriculture: thus development of a sustainable Corn Belt agriculture depends on sustainable swine production systems. Swine are versatile enough to adapt to sustainable concepts, and swine production raises several opportunities to enhance sustainability. These include: 1) feeding with increased use of forages and by-product feeds; 2) nutrient cycling through

improved handling of manure; 3) low-capital housing systems that offer an improved environment for the operator and reduced financial risk; 4) management systems suited to the swine's behavior; and 5) preventive approaches to swine health and a broader genetic base. The challenge beyond identifying the opportunities is research and technology transfer and incorporation of sustainable concepts into ecologically based swine production systems.

NAL Call No.: S605.5.A43

193. Swine.

Crenshaw, M.; Forrest, C.; Ferrell, K.

Inf-Sheet-Miss-State-Univ-Coop-Ext-Serv. [Starkville], Cooperative Extension Service, Mississippi State University. Mar 1994. (1492) 2 p.

Descriptor: pig-farming; production-costs; reproductive-efficiency; pig-feeding; disease-prevention; animal-wastes; record-keeping; agricultural-prices; marketing-; mississippi-; corn-belt-states-of-usa; north-carolina

NAL Call No.: S544.3.M7M5

194. Swine growing-finishing units.

Meyer, V. M.; Driggers, L. B.; Ernest, K.; Ernest, D.

Ext-bull-Coop-Ext-Serv, -Mich-State-Univ p.7. (1994).

In the subseries: Housing.

Descriptor: pigs-; animal-production; growth-stages; pig-housing; temperature-; humidity-; ventilation-; dust-control; building-construction; pens-; nipple-drinkers; pig-manure; handling-

NAL Call No.: 275.29-M58B

195. Swine-lagoon seepage in sandy soil.

Westerman, P. W.; Huffman, R. L.; Feng, J. S.

Pap-Am-Soc-Agric-Eng. St. Joseph, Mich. : American Society of Agricultural Engineers, . Winter 1993. (93-2531/93-2550) 34 p. Paper presented at the "1993 International Winter Meeting sponsored by the American Society of Agricultural Engineers," December 12- 17, 1993, Chicago, Illinois.

Descriptor: animal-wastes; pigs-; waste-disposal; lagoons-; sandy-soils; seepage-; groundwater-; water-quality; environmental-impact

NAL Call No.: 290.9-Am32P

196. Swine manure application rate and rain intensity effects on runoff.

Edwards, D. R.; Daniel, T. C.

Ark-farm-res v.43, p.6-7. (1994).

Includes references.

Descriptor: pig-manure; runoff-water; water-quality; application-rates; rain-; festuca-arundinacea; arkansas-

NAL Call No.: 100-Ar42F

197. Swine manure as a fertilizer source.

AG-N-C-Agric-Ext-Serv-N-C-State-Univ. Raleigh, N.C. : The Service. June 1993. (439-4, rev.) 5 p. Includes references.

Descriptor: pig-manure; nutrient-content; nutrient-availability; application-to-land; fertilizer-requirement-determination
NAL Call No.: S544.3.N6N62

198. Swine manure characterization as affected by environmental temperature, dietary level intake, and dietary fat addition.

Clanton, C. J.; Nichols, D. A.; Moser, R. L.; Ames, D. R.

Trans-A-S-A-E v.34, p.2164-2170. (1991).

Literature review.

Descriptor: pig-manure; urine-; physicochemical-properties; diet-; dietary-fat; environmental-temperature; feed-intake; literature-reviews; kansas-

Abstract: Physical, chemical, and energy characteristics of swine urine and feces were determined. Changes in urinary and fecal characteristics were determined as pigs were exposed to changes in ambient temperature, feed intake, and dietary fat concentration as well as increases in body mass. The data indicate a large variation in the characteristics of urine and feces when pigs are exposed to different environmental conditions. Fecal total solids and total volatile solids concentrations decreased as pig mass increased. Urinary total solids and total volatile solids concentrations decreased and urinary energy content increased as ambient temperature increased. Urinary NH₃-N concentration was less in the fat-added diet than in the non-fat diet.

NAL Call No.: 290.9-AM32T

199. Swine wastewater treatment in constructed wetlands.

Hunt, P. G.; Humenik, F. J.; Szogi, A. A.; Rice, J. M.; Stone, K. C.; Sadler, E. J.

Environmentally sound agriculture proceedings of the second conference 20-22 April 1994 / p.268-275. (1994).

Includes references.

Descriptor: pigs-; animal-wastes; waste-water-treatment; wetlands-; juncus-effusus; scirpus-; species-; sparganium-; typha-angustifolia; typha-latifolia; glycine-max; oryza-sativa; growth-; crop-yield; wetland-soils; redox-reactions; nitrogen-; phosphorus-; removal-

NAL Call No.: S589.7.E57-1994

200. Theoretical and experimental study of a sequential batch reactor treatment of liquid swine manure.

Fernandes, L.; McKyes, E.

Trans-A-S-A-E v.34, p.597-602. (1991).

Includes references.

Descriptor: liquid-manures; pig-slurry; waste-disposal; waste-treatment; carbon-; nitrogen-; removal-; theory-; mathematical-models

Abstract: A laboratory scale sequential batch reactor (SBR) was used to digest liquid swine manure containing 1 to 2% suspended

solids. Hydraulic retention time, biological solid retention time and influent concentration were varied during the tests. The treated effluent was analyzed for suspended solids, chemical oxygen demand, ammonia, and nitrate plus nitrite. In addition, a mathematical model was developed to describe the changes in concentration with time of chemical oxygen demand, ammonia, and nitrate plus nitrite in the SBR reactor. Results of the experimental study showed that the single reactor SBR process is capable of reducing the potential polluting carbon and nitrogen components of a concentrated wastewater to a high degree when it is operating at 7 to 9 days HRT and a BSRT around 20 days. The mathematical model developed followed quite closely the changes in COD, ammonia, and oxides of nitrogen on a laboratory scale, and should be useful for assessment of SBR system designs for commercial swine manure treatment.

NAL Call No.: 290.9-AM32T

201. Thermophilic aerobic process for the treatment of slaughterhouse effluents with protein recovery.
Couillard, D.; Zhu, S.

Environ-Pollut v.79, p.121-126. (1993).

Includes references.

Descriptor: slaughterhouse-waste; pigs-; waste-treatment; waste-utilization; aerobic-treatment; thermophilic-bacteria; chemical-oxygen-demand; temperature-; biomass-; protein-; protein-quality; amino-acids; single-cell-protein

NAL Call No.: QH545.A1E52

202. Treatment and application of swine waste.
Fu, C. M.; Chen, S. Y.; Chow, H. M.

Taiwan-Sugar v.38, p.25-29. (1991).

Includes references.

Descriptor: pigs-; pig-slurry; animal-wastes; treatment-; taiwan-

NAL Call No.: 65.8-T133

203. Treatment of animal manure and wastes for ultimate disposal--review.
Winter, J.; Hilpert, R.; Schmitz, H.

Asian-Australasian-J-Anim-Sci v.5, p. 199-215. (1992).

Literature review.

Descriptor: animal-manures; chemical-composition; anaerobic-treatment; methanobacterium-; methane-production; antibiotics-; pig-slurry; fertilizer- technology; germany-

NAL Call No.: SF55.A78A7

204. Treatment of dilute manure wastewaters by chemical coagulation.
Sievers, D. M.; Jenner, M. W.; Hanna, M.

Trans-ASAE v.37, p.597-601. (1994).

Includes references.

Descriptor: poultry-; cattle-; pigs-; manures-;

waste-water-treatment; coagulation-

Abstract: Results from laboratory coagulation-settling

experiments using five coagulants (one inorganic salt and four organic polymers) on four dilute wastewaters (fresh manure from swine, poultry, and cattle and effluent from a swine anaerobic digester) are presented to provide chemical coagulation data for designing treatment facilities for livestock and poultry. Adjustment of pH alone was generally ineffective in promoting coagulation on all wastewaters. Values of pH above nine were effective for swine wastewater. Ferric chloride removed 60 to 70% of the volatile solids (VS) for cattle and swine at concentrations of 300 to 450 mg/L, but was less effective on poultry wastewater. Addition of organic polymers with iron salt did not improve coagulation from swine wastewater. Synthetic polymers and chitosan were excellent coagulants for all manure wastewaters but not for digester effluent. Based upon the effective concentrations to remove suspended solids from the flush waters of a 1,000-head swine finishing unit, synthetic polymers are the most cost-effective chemical coagulant, while chitosan is the least cost-effective.

NAL Call No.: 290.9-Am32T

205. Treatment of pig slurry using the pump-stirred aerator. Williams, D. W.; Cumby, T. R.; Scotford, I.

Pap-Am-Soc-Agric-Eng. St. Joseph, Mich. : American Society of Agricultural Engineers, . Summer 1991. (914002) 7 p.

Paper presented at the "1991 International Summer Meeting sponsored by the American Society of Agricultural Engineers," June 23-26, 1991, Albuquerque, New Mexico.

Descriptor: pig-slurry; pig-manure; aerobic-treatment; aeration-

NAL Call No.: 290.9-Am32P

206. Use of alkaline fly ash as an amendment for swine manure.

Vincini, M.; Carini, F.; Silva, S.

Bioresour-technol v.49, p.213-222. (1994).

Includes references.

Descriptor: pig-manure; fly-ash; mixtures-; nutrient-content; mineral-content; phosphorus-; solubility-; boron-; microbial-degradation; carbon-dioxide; gas-production; respiration-; waste-utilization

NAL Call No.: TD930.A32

207. Use of water hyacinth (*Eichhornia crassipes*) in upgrading small agroindustrial wastewater treatment plants. Yeoh, B. G.

Water-sci-technol v.28, p.207-213. (1993).

Proceedings of the 2nd International Conference on, "Design and Operation of Small Wastewater Treatment Plants," June 28-30, 1993, Trondheim, Norway / edited by H. Odegaard.

Descriptor: eichhornia-crassipes; waste-water-treatment; palm-oil-mill-effluent; piggery-effluent; food-wastes; industrial-wastes; biological-treatment; efficiency-; biomass-production; chloride-; water-quality; pollution-control; malaysia-; sugary-refinery-effluent; natural-rubber-effluent

NAL Call No.: TD420.A1P7

208. Valorization of solid wastes from biomethanisation of pig breeding effluents.
Duarte, E. A.; Mendes, B.; Oliveira, J. S.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.26, p.2097-2100. (1992).

In the series analytic: Water Quality International '92. Part 5 / edited by M. Suzuki, et.al. Proceedings of the Sixteenth Biennial Conference of the International Association on Water Pollution Research and Control held May 24-30, 1992, Washington, D.C.

Descriptor: piggery-effluent; waste-treatment; methane-production; effluents-; nutrient-content; coagulation-; flocculation-; protein-concentrates; feed- evaluation

NAL Call No.: TD420.A1P7

209. vanA-mediated high-level glycopeptide resistance in Enterococcus faecium from animal husbandry.
Klare, I.; Heier, H.; Claus, H.; Reissbrodt, R.; Witte, W.

FEMS-micro-biol-lett v.125, p.165-171. (1995).

Includes references.

Descriptor: streptococcus-faecium; avoparcin-; feed-additives; drug-resistance; genetic-resistance; genes-; bacterial-proteins; dna-; pig-manure; poultry-manure; chicken-meat; hospital-food-service; sewage-; waste-water; vana-gene; membrane-proteins; pig-farms; poultry-farms

Abstract: Glycopeptide-resistant Enterococcus faecium strains were isolated from a pig farm and a poultry farm both using avoparcin as a food additive. Such organisms were not isolated in a hen's eggs-producing farm not using avoparcin. Glycopeptide-resistant enterococci were also detected in broiler chicken carcasses that were delivered to a hospital's kitchen. The resistance was determined by the vanA gene as indicated by the detection of the inducible 39-kDa cytoplasmic membrane protein and of a vanA-specific DNA sequence amplified by polymerase chain reaction. Genomic DNA fragment patterns of strains from animal sources were different from each other and also from those of strains isolated in hospitals and from sewage treatment plants. This findings suggest the dissemination of the vanA determinant among different enterococcal strains of distinct ecological origin.

NAL Call No.: QR1.F44

210. Vermicomposting in the management of pig-waste in Hong Kong.
Wong, S. H.; Griffiths, D. A.

World-J-Microbiol-Biotechnol. Oxford : Rapid Communications of Oxford Ltd. with UNESCO. Nov 1991. v. 7 (6) p. 593-595.

Includes references.

Descriptor: pig-manure; pig-slurry; vermicomposting-; pheretima-; hong-kong; pheretima-asiatica

NAL Call No.: QR1.M562

211. Vesicular-arbuscular mycorrhiza infection in cut grassland following long-term slurry application.

Christie, P.; Kilpatrick, D. J.

Soil-Biol-Biochem v.24, p.325-330. (1992).

Includes references.

Descriptor: lolium-perenne; agrostis-stolonifera; poa-; vesicular-arbuscular-mycorrhizas; glomus-tenuis; endophytes-; grasslands-; cattle-slurry; pig-slurry; application-rates; application-to-land; long-term-experiments; roots-; infections-; assessment-; botanical-composition; temporal-variation; soil-ph; nutrient-availability; phosphorus-; copper-; zinc-; heavy-metals; grassland-management; northern-ireland

Abstract: Herbage root samples from a long-term field experiment in which pig and cow slurries had been applied to cut grassland for 19 yr were examined for vesicular-arbuscular (VA) mycorrhiza. There were fertilized and unfertilized controls and three application rates (50, 100 and 200 m³ ha⁻¹ yr⁻¹) of both types of slurry, with six replicate plots in randomized blocks. Soil samples were analysed for pH (in water), "total" Cu and Zn, EDTA-extractable Cu and Zn and NaHCO₃-extractable P. The proportions of *Lolium perenne*, *Agrostis stolonifera* and *Poa* spp in the herbage dry matter at the first cut of 1989 were also determined. Despite contrasting long-term effects of the two types of slurry on soil pH, increasing application rate of both pig and cow slurries produced a marked decrease in overall mycorrhizal infection of plant roots in the sward with a corresponding increase in infection by the fine endophyte, *Glomus tenuis*. Calculated correlation coefficients showed that mycorrhizal infection was related to soil extractable P, Cu, Zn and pH, and also to differences in sward botanical composition, especially the proportion of *L. perenne*. Furthermore, stepwise multiple regression analysis identified soil chemical properties, especially total Zn and pH, as the more important explanatory variables in preference to botanical composition.

NAL Call No.: S592.7.A1S6

212. Water-manure interactions on ammonia volatilization.
Gordon, R.; Schuepp, P.

Biol-fertil-soils v.18, p.237-240. (1994).

Includes references.

Descriptor: pig-manure; ammonia-; volatilization-; ph-; application-methods; surface-application

NAL Call No.: QH84.8.B46

213. A waterwater treatment system for an industrialized pig farm.

Chin, K. K.; Ong, S. L.

Water-sci-technol v.28, p.217-222. (1993).

In the special issue: Development and water pollution control in Asia / edited by R. Bhamidimarri, X. Li and S. Liu. 24, 1991, Shanghai, China.

Descriptor: pig-farming; large-farms; waste-water-treatment; anaerobic-digestion; lagoons-; singapore-

NAL Call No.: TD420.A1P7

214. Yield stability and fertilizer efficiency of long-term

triple cereal cropping in paddy fields in China.
Li, S. Y.

Biol-Fertil-Soils v.16, p.151-153. (1993).

Includes references.

Descriptor: oryza-sativa; pig-manure; cropping-systems;
crop-yield; hordeum-vulgare; triticum-aestivum; zea-mays;
sustainability-; china-

NAL Call No.: QH84.8.B46

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