LIVESTOCK WASTE MANAGEMENT AND POLLUTION ABATEMENT

PROCEEDINGS
INTERNATIONAL SYMPOSIUM ON LIVESTOCK WASTES

APRIL 19-22, 1971

CENTER FOR TOMORROW, THE OHIO STATE UNIVERSITY
2400 OLENTANGY RIVER ROAD, COLUMBUS, OHIO

Published by
AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS
ST. JOSEPH, MICHIGAN 49085
PHONE (616) 983-6521
1971
I Introduction
Animal Wastes and America the Beautiful—N. D. Bayley
Welcome Remarks—N. G. Fawcett

II In Perspective
The Missing Link—W. J. Whorton
Role of State Departments of Agriculture in Problems of Animal Waste Management—W. S. Cath
Responsibilities of a Professional Society Toward Urgent Social Problems—R. E. Stewart
Putting It All Together—H. H. Curry

III Waste Disposal Systems
Livestock Waste Management and the Conservation Plan—C. E. Fogg
Technological and Technical Conceptions of Manure Handling in Czechoslovakia—M. Velebil
A Land Recycling Liquid Manure System for a Large-Scale Confinement Operation in a Cold Climate—J. E. Turnbull, F. R. Hore and M. Feldman

IV Beef Feedlot
Measurement of Runoff and Runoff Carried Waste from Commercial Feedlots—J. M. Madden and J. N. Dornbush
Management of Barnlot Runoff to Improve Downstream Water Quality—W. M. Edwards, F. W. Chichester and L. L. Harrold
Transport of Pollutants from Sloping Cattle Feedlots as Affected by Rainfall Intensity, Duration, and Recurrence—N. P. Swanson, L. N. Mielke, J. C. Lorimor, T. M. McCalla and J. R. Ellis
Characteristics of Manure Accumulations Removed from Outdoor, Unpaved, Beef Cattle Feedlots—C. B. Gilbertson, T. M. McCalla, J. R. Ellis, and W. R. Woods
Feedlot Manure Management in a Desert Climate—S. R. Morrison, G. P. Lofgreen and T. E. Bond
Evaluation of Beef Feedlot Waste Management Alternatives—A. F. Butchbaker, J. E. Garton, G. W. A. Mahoney and M. D. Paine
The Waste Pattern of Beef Cattle on Slatted Floors—R. O. Hegg and R. E. Larson

V Systems
Analysis of Duck Farm Waste Treatment Systems—D. D. Schulte and R. C. Loehr
Solving the Poultry Manure Problem Economically Through Dehydration—G. O. Bressler and E. L. Bergman
A Farm Scale Dairy Waste Disposal System—D. O. Turner and D. E. Proctor
A Total Biochemical Recycle Process for Cattle Wastes—L. G. Carlson

VI Legal and Administrative Considerations
The UK Reconciliation of Modern Intensive Livestock Farming with a Basically Urban Society—K. B. C. Jones
Litigation Experiences of Five Livestock and Poultry Producers—T. L. Willrich and J. R. Miner
VII Characteristics

Identification of Carbonyl Compounds in a Swine-Building Atmosphere—L. D. Hartung, E. G. Hammond and R. J. Miner

Meteorological Control of Malodors from Land Spreading of Livestock Wastes—R. A. Nordstedt and E. P. Taiganides


Control of Odors from Poultry Houses—G. B. Willson

Ammonia Desorption from Concentrated Chicken Manure Slurries—A. C. Hashimoto and D. C. Ludington

Antibiotic Resistance and Resistance Transfer Between Bacterial Isolates in a Waste Lagoon—M. Bromel, Y. N. Lee and B. Baldwin

Differentiation of Ruminant from Non-Ruminant Fecal Sources of Water Pollution by Use of Enteric Bacteria—P. R. Middaugh, L. R. Koupal, R. L. Pierce, Jr., J. E. Tiede and J. W. Zerfas

Growth Kinetics of Rumen Bacteria in Solutions of Poultry Excreta—H. E. Hamilton, J. J. Ross, J. J. Begin and S. W. Jackson

The Role of Microorganisms in the Management of Animal Wastes on Beef Cattle Feedlots—T. M. McCalla and L. F. Elliott

VIII Hydraulic Transport

Agitation in Liquid Manure Tanks—J. I. Sewell


Automated Handling, Treatment and Recycling of Waste-water from an Animal Confinement Production Unit—E. P. Taiganides and R. K. White


IX Composting

High Rate Poultry Manure Composting with Sawdust—W. S. Galler and C. B. Davey

Composting Dairy Cow Wastes—G. B. Willson

X Characteristics

Quality of Effluent from Farm Animal Production Sites—J. W. D. Robbins, G. J. Kriz and D. H. Howells

Water Hyacinths to Further Treat Anaerobic Lagoon Effluent—J. R. Miner, J. W. Wooten and J. D. Dodd

Enzyme-Facilitated Microbial Decomposition of Cattle Feedlot Manure—G. K. Elmund, S. M. Morrison and D. W. Grant


BOD Analysis of Swine Waste as Affected by Feed Additives—J. D. Ariail, F. J. Humenik and G. J. Kriz


XI Drying


Pyrolysis of Livestock Wastes—R. K. White and E. P. Taiganides

XII Economics

Economics of Waste Disposal from Confined Livestock—W. H. M. Morris ........................................ 195
Marketing Converted Poultry Manure—H. C. Jordan ........ 197
The Economics of Swine Waste Disposal—R. W. Okey and S. Balakrishnan ........................................ 199
Economic Implications of Environmental Quality Legislation for Confined Animal Feeding Operations—D. D. Badger and G. R. Cross ..................................................... 204
Cost of Maintaining Specified Levels of Water Pollution Control for Confined Cattle Feeding Operations for the Southern High Plains—H. Y. Lee and T. R. Owens ......................... 207

XIII Aerobic Treatment

An Oxidation Ditch for the Handling and Treatment of Poultry Wastes—R. C. Loehr, D. F. Anderson and A. C. Anthonisen ................................................................. 209
Design, Installation and Biological Assessment of a Passer Oxidation Ditch on a Large British Columbia Swine Farm—T. A. Windf, N. R. Bulley and L. M. Staley ........................................... 213
Beef Wastes and the Oxidation Ditch Today and Tomorrow—R. E. Larson and J. A. Moore .............................................. 217
Aerobic Treatment of Liquid and Solid Poultry Manure—J. Pos, R. G. Bell and J. B. Robinson ................................. 220

XIV Land Disposal

Crop Production and Soil Analyses as Affected by Applications of Cattle Feedlot Waste—A. C. Mathers and B. A. Stewart ......................................................... 229
Water Quality of Runoff from Grassland Applied with Liquid, Semi-Liquid, and "Dry" Dairy Waste—T. A. McCaskey, G. H. Rollins and J. A. Little ........................................... 239
Fate of Inorganic Forms of N and Salt from Land-Disposed Manures from Dairies—D. C. Adriano, P. F. Pratt and S. E. Bishop ................................................................. 243
Effect of Rate of Poultry Manure Application on Selected Soil Chemical Properties—L. H. Hileman ......................... 247
Groundwater Pollution Due to High Organic Manure Loadings—T. J. Concannon, Jr. and E. J. Genetelli ........ 249
Subsurface Disposal of Liquid Manure—H. D. Bartlett and L. F. Marriott ..................................................... 258

XV Aerobic Treatment and Storage

Aerobic Storage of Poultry Manure—T. A. Stewart and R. McIlwain ..................................................... 261
Survival and Detection of Leptospires in Aerated Beef Cattle Manure—S. L. Diesch, B. S. Pomeroy and E. R. Alired . 263
Nitrogen Transformation During Aerobic Digestion and Denitrification of Dairy Cattle Wastes—C. C. Chang, A. C. Dale and J. M. Bell ..................................................... 272

Directory of Products and Services
Aerobic Biological Breakdown of Farm Waste—P. ten Have 275
Low-Volume, Surface-Layer Aeration Conditioned Manure Storage—C. L. Barth and L. B. Polkowski 279
Short Term Aeration of Dairy Cattle Manure for Irrigation—J. R. Ogilvie and A. C. Dale 283
The Use of Oxidation Ponds for Poultry Processing Waste Disposal—R. L. Wesley, E. B. Hale and H. C. Porter 286
Acclimatization Response Time for Aerobic Waste Digestors—D. T. Hill and R. E. Smith 288

XVI  Refeeding

Cattle Manure as Feed for Cattle—W. B. Anthony 293
Nutritive Value of Chicken Manure for Cattle—L. S. Bull and J. T. Reid 297
Dehydrated Poultry Waste (DPW) as a Feedstuff in Poultry Rations—C. J. Flegal and H. C. Zindel 305
The Effects of Including Dried Poultry Waste in the Feed of Laying Hens—B. Hodgetts 311
Biodegraded Hen Manure and Adult House Flies: Their Nutritional Value to the Growing Chick—C. C. Calvert, N. O. Morgan and H. J. Eby 319

XVII  Land Disposal

Movement of Pollutant Phosphorus in Saturated Soils—P. R. Goodrich and E. J. Monke 325
Nitrogen Removal from Sewage Waters by Plants and Soil—V. Larsen and J. H. Axley 338

XVIII  Solid-Liquid Separation

Renovation and Reuse of Water for Dilution and Hydraulic Transport of Dairy Cattle Manure—R. E. Graves, J. T. Clayton and R. G. Light 341
The Separation of Solid and Liquid Parts of Pig Slurry—J. C. Glerum, G. Klomp and H. R. Poelma 345
Dewatering Poultry Manure by Centrifugation—I. J. Ross, J. J. Begin and T. M. Midden 348