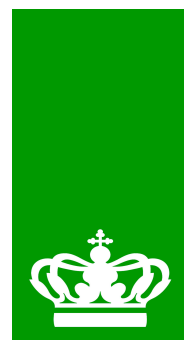


12th RAMIRAN International Conference

**"TECHNOLOGY FOR RECYCLING OF
MANURE AND ORGANIC RESIDUES IN
A WHOLE-FARM PERSPECTIVE"**

11-13 September, 2006

Conference venue: The historic open-air museum "The Old Town", Aarhus, Denmark



About RAMIRAN

The Network on Recycling of Agricultural, Municipal and Industrial Residues in Agriculture (RAMIRAN) is part of ESCORENA - the European System of Cooperative Research Networks in Agriculture. ESCORENA was established by the FAO Regional Office for Europe (REU) in 1974. It is a form of voluntary research cooperation among interested national institutions involved in research in food or agriculture in European countries. Over the years, ESCORENA has expanded its field of activities to include topics and themes of interest to other countries, particularly those from the Near East and Mediterranean area.

Network coordinator: José Martinez, CEMAGREF, France.
Email: Jose.Martinez@cemagref.fr

Much of the detailed work of the network is undertaken by the Working Groups. There are currently 7 Working Groups within RAMIRAN including 2 new groups that were established at the last Workshop in Gargnano.

The titles, chairmen and contact details for these groups are listed below.

Hygienic aspects

Reinhard Böhm
Universität Hohenheim, Germany
Email: boehm@Uni-Hohenheim.de

Gaseous emissions

Tom Misselbrook
Inst. Grassland and
Environmental Research, UK
Email:
tom.misselbrook@bbsrc.ac.uk

Heavy metals

Fiona Nicholson
ADAS, UK
Email:
fiona.nicholson@adas.co.uk

Other wastes generated on the farm

Paolo Balsari
DEIFA, Università di Torino, Italy
Email: balsari@agraria.unito.it

Management of organic wastes

Giorgio Provolo
Istituto di Ingegneria Agraria, Italy
Email: Giorgio.provolo@unimi.it

Composting and treatment of organic wastes

Maria-Filar Bernal
Ctro de Edafología y Biología
Aplicada del Segura, Spain
Email:
pbernal@natura.cebas.csic.es

Information Technology

Jan Venglovsky
University of Veterinary
Medicine, Slovak Republic
Email: ramiran@ramiran.net

Sunday, September 10

18:00 – 20:00 *Registration (optional) at "Hobro-huset" in "The old Town" (next to "Helsingør Theater")*

Posters for the Monday session may be mounted

Monday, September 11

08:30 *Registration at "Helsingør Theater" in "The old Town"*

Welcome ceremony and Introductions

Chair: Sven G. Sommer

09:30 **Welcome address**

Professor Sven G. Sommer, chairman of the organizing committee

09:35 **Welcome address**

Dr. José Martinez, coordinator of the Ramiran network

09:40 **Welcome address**

Deputy Director Søren A. Mikkelsen, Danish Institute of Agricultural Sciences

09:50 **Official opening of the conference**

Hans Christian Schmidt, Minister of Food, Agriculture and Fisheries

Efficiency and impact of livestock production systems

Chair: Sven G. Sommer

10:00 I-1 **A farm level approach for mitigating greenhouse gas emissions from ruminant livestock systems**

René L.M. Schils, Jørgen E. Olesen, Agustín del Prado and Jean-François Soussana

10:30 *Coffee break*

11:00 I-2 **Nutrient losses from manure management**

Oene Oenema, Diti Oudendag and Gerard Velthof

11:30 I-3 **Manure as a key resource to sustainability of smallholder farming systems in Africa: An introduction to the NUANCES framework**

Ken Giller, Nico de Ridder, Mariana Rufino, Pablo Tittonell, Mark van Wijk and Shamie Zingore

12:00 **Announcements etc.**

Søren O. Petersen

12:15 *Lunch and posters*

Feed impact on slurry composition and emissions

Chair: Hanne D. Poulsen

- 14:00 I-4 **Impact of nutrition on nitrogen, phosphorus and trace elements in pig manure and emissions in the air**
Jean-Yves Dourmad and Catherine Jondreville
- 14:30 O-1 **Reducing ammonia volatilisation from pig slurry through the reduction of dietary crude protein and the incorporation of benzoic acid**
Fabrice Guiziou, Jean-Yves Dourmad, Patricia Saint Cast, Sylvie Picard and Marie-Line Daumer
- 14:45 O-2 **Diet influence on ammonia emissions in lactating dairy cows**
Merino P., Arriaga H., Salcedo G., Marton L. and Pinto M.
- 15:00 O-3 **Modelling methane emission from dairy cows**
Allan Danfær and Martin Riis Weisbjerg
- 15:15 O-4 **Dietary electrolytes affect slurry composition and volume from dairy cows**
J. Sehested and P. Lund

Poster session incl. refreshments

- 15:30 P-101 **Cattle slurry digestion does not improve the long term nitrogen use efficiency of farms**
Jaap Schröder and Dik Uenk
- P-102 **Overview of evaluations of alternative swine manure management systems in North Carolina, USA**
Philip Westerman
- P-103 **Managing dirty water to reduce slurry volumes on UK dairy farms**
J.A. Laws and D.R. Chadwick
- P-104 **Treatment of sewage sludge with zeolite alone or in combination with lime on selected parasitological and bacteriological parameters**
Jan Venglovsky, Nada Sasakova, Jose Martinez, Milada Vargova, Olga Ondrasovicova, Miloslav Ondrasovic, Kornelia Culenova and Ingrid Papajova
- P-105 **Salmonella reduction in manure by the addition of urea and ammonia**
J.R. Ottoson, B. Vinnerås and A. Nordin
- P-106 **Effect of integrated forage rotation and manure management systems on soil carbon storage**
Enrico Ceotto, Lamberto Borrelli, Rosa Marchetti and Cesare Tomasoni
- P-107 **Manure organic carbon inputs and soil quality**
Anne Bhogal, Fiona Nicholson & Brian Chambers
- P-108 **Recycling organic wastes from food production: the GRUB'S UP perspective**
María-Pilar Bernal
- P-109 **Quantifying heavy metal inputs to agricultural soils in England and Wales**
F.A. Nicholson and B.J. Chambers
- P-110 **Consumer attitudes and potential markets for composted food wastes in south west England**
David Tompkins and Rob Parkinson

- P-111 **Whole-farm nitrogen balances on Basque Country dairy farms**
O. del Hierro, A. Artetxe and M. Pinto
- P-112 **Effect of sexual neutralization on fattening Piemontese male calves' nitrogen excretion**
Davide Biagini and Carla Lazzaroni
- P-113 **Explaining the diversity of environmental performances according to a typology of farming practices combinations: the case of the dairy cattle breeding in Réunion Island**
Vayssières, J., Lecomte, P., Guerrin, F., Bocquier, F. and Verdet, C.
- P-114 **Dietary and faecal phosphorus levels in commercial dairy farms of the Basque Country**
Arriaga H., Pinto M., Calsamiglia S. and Merino P.
- P-115 **Assessment of the balance between livestock effluent production and nutrient demand by crops in a small agricultural area of The Reunion Island**
Jean-Michel Médoc, Thierry Raimbault and Bruce Ayache
- P-116 **Environmental risk assessment of manure management**
Provolo G. and Ferrari O.
- P-117 **Effect of ration on faecal nutrient output from sheep and dairy cows**
Martin Riis Weisbjerg, Peter Lund and Torben Hvelplund
- P-118 **Comparison of models used for the calculation of national ammonia emission inventories from agriculture in Europe**
H. Menzi, B. Reidy, U. Dämmgen, H. Döhler, B. Eurich-Menden, F.K. van Evert, N.J. Hutchings, H.H. Luesink, H. Menzi, T.H. Misselbrook, G.-J. Monteny and J. Webb
- P-119 **Historical development of livestock and manure management in Switzerland**
Beat Reidy, Peter Moser and Harald Menzi
- P-120 **The composition of faeces and urine from slaughter pigs and gestating sows is determined by diet composition**
José A. Fernández
- P-121 **Transport of estrogenic hormones and faecal bacteria through structured soils amended with manure from a weaner producing farm**
Jeanne Kjær, Preben Olsen, Kaare Johnsen, Carsten Suhr Jacobsen and Bent Halling
- P-122 **Use of different manures and organic wastes in the suppression of the cereal cyst nematode *Heterodera avenae* by biofumigation**
Javier López-Robles, Casilda Olalla, Carlos Rad, Yolanda Arribas, Milagros Navarro, Juana Isabel López-Fernández and Salvador González-Carcedo
- P-123 **Survival of *Ascaris suum* eggs and *Eimeria* oocysts during composting**
Papajová, I., Juriš, P., Szabová, E., Venglovský, J. and Sasáková, N.
- P-124 **Phosphorus in pig manure is affected by dietary means**
Hanne Damgaard Poulsen and Karoline Johansen
- P-125 **Quantification of nitrogen and phosphorus in manure in the Danish normative system**
Hanne Damgaard Poulsen, Peter Lund, Jakob Sehested, Nicholas Hutchings and Sven G. Sommer

Manure management in developing countries

Chair: José Martinez

- 16:30 O-5 **Chicken manure treatment and application – an overview of the ASIA-PRO-ECO project CHIMATRA**
Ina Körner, Henrich Roeper, Helmut Adwiraah, Rainer Stegmann, Jan Hujsmans, Nico Ogink, Ahmad Makmom Abdullah, Mohd Nasir Hassan, Wan Nor Azmin Sulaiman and Thiam Ming Chee
- 16:45 O-6 **Manure management practices in Mexico and In-vessel composting of food wastes in the UK: feedstock and output characteristics**
Joel Velasco-Velasco, David Tompkins and Rob Parkinson
- 17:00 O-7 **Farm location and manure management practices - Insights from a case study on pig production in Central Thailand**
Pierre Gerber, Harald Menzi and Henning Steinfeld
- 18:30 **Mayors reception at the City Hall**

Tuesday, September 12

Manure and waste management strategies

Chair: O. Oenema

- 08:30 I-5 **The contribution of separation technologies to the management of livestock manure**
C.H. Burton
- 09:00 I-6 **Interactions between biomass energy technologies and nutrient and carbon balances at the farm level**
Uffe Jørgensen and Bjørn Molt Petersen
- 09:30 I-7 **Biosecurity and arable use of manure and biowaste**
Ann Albihn and Björn Vinnerås
- 10:00 *Coffee break*
- 10:30 I-8 **The present status of rapid methods for on-farm analysis of manure composition with emphasis on N and P: What is available and what is lacking?**
James B. Reeves, III
- 11:00 **Plenum discussion**

Physical/chemical treatment methods

Chair: C. Burton

- 11:30 O-8 **Slurry acidification – consequences for losses and plant availability of nitrogen and sulphur**
Jørgen Eriksen and Peter Sørensen
- 11:45 O-9 **Innovative technology for recycling of manure phosphorus with rapid amorphous phosphate precipitation**
A.A. Szogi, M.B. Vanotti, P.J. Bauer, K.G. Scheckel and W.H. Hudnall

- 12:00 O-10 **Removal of Salmonella contamination before using plant nutrients from household waste and wastewater in agriculture**
Vinnerås, B., Nordin, A., Ottoson, J., Berggren, I., Albiñ, A., Bagge, E. and Sahlström, L.
- 12:15 O-11 **Effects of slurry additives and ozone treatment on odour emissions from pig slurry**
Martin N. Hansen, Morten Bang, Arne G. Hansen and Anders Feilberg
- 12:30 *Lunch and posters*
- 14:00 O-12 **Wet oxidation pre-treatment– the way to improve economics of energy production from manure?**
Hinrich Uellendahl and Birgitte Ahring
- 14:15 O-13 **Optimal plant nutrient distribution in and biogasification of manure separation products, separated with FeCl₃ as coagulant**
Maibritt Hjorth, Tavs Nyord, Anders M. Nielsen and Sven G. Sommer

Biological treatment methods

Chair: M.P. Bernal

- 14:30 O-14 **Monitoring and optimisation of biogas production**
Alastair Ward, Phil Hobbs, Peter Holliman and Davey Jones
- 14:45 O-15 **Anaerobic co-digestion of pig manure with fruit wastes. Process development for the recycling in decentralised farm scale plants**
Luís J. M. Ferreira
- 15:00 P-229 **A new technology to process swine manure**
Anni Kokkonen, Erkki Aura and Risto Seppälä

Poster session incl. refreshments

- 15:15 P-201 **Biogas production and process kinetics in serial coupled anaerobic digesters**
Anders Michael Nielsen and Henrik Bjarne Møller
- P-202 **Biogas Forum Austria: network for research, extension service, and commercial farms**
Thomas Amon, Barbara Amon, Vitaliy Kryvoruchko, Katharina Hopfner-Sixt, Andreas Moser and Werner Zollitsch
- P-203 **Monitoring of energy crop digestion in Austria**
Katharina Hopfner-Sixt, Thomas Amon, Dejan Milovanovic and Barbara Amon
- P-204 **European Biogas Initiative to improve the yield of agricultural biogas plants (EU-Agro-Biogas)**
Thomas Amon, Barbara Amon, Andrea Machmüller, Katharina Hopfner-Sixt, Vitaliy Kryvoruchko and Vitomir Bodiroza
- P-205 **Process performance of biogas plants integrating pre-separation of manure**
Henrik B. Møller, Anders M. Nielsen, G. Hastrup Andersen and Ryoh Nakakubo

- P-206 **Impact of peat and polystyrene ball covers on ammonia emissions from the storage and spreading of pig slurry: a farm-scale study**
L Loyon, F. Guiziou, S Picard and P Saint-cast
- P-207 **Ammonia emission from the management of solid fraction derived from the mechanical separation of slurry**
Fabrizio Gioelli, Paolo Balsari, Elio Dinuccio and Eliana Santoro
- P-208 **Optimising degradation of PAHs in soils using different composting approaches**
Nadine Loick, Phil J. Hobbs, Mike D. Hale and Davey L. Jones
- P-209 **Proportions and characteristics of particle size fractions in two different cattle slurries**
D. Fanguero, R. Bol and D. Chadwick
- P-210 **Assessment of the potential N mineralization of six particle size fractions of two different cattle slurries**
D. Fanguero, R. Bol and D. Chadwick
- P-211 **Characterization of pig slurries and treatment efficiencies in Central Spain**
Eloy Bécares, Linda A. Torres-Villamizar, Roberto Reinoso, Juan. A. Alvarez, Mari Cruz García and Cristina León
- P-212 **Determination of the organic matter biodegradability using physico-chemical and biological fractionation**
Fabrice Béline, Céline Druilhe, Sylvie Gillot, Jean-Michel Helmer, Vassilia Vigneron, Patricia Saint-Cast, Fabien Vedrenne, Lucie Berthe, Stéphane Bons, Cécile Miège, Catherine Gourlay and Jean-Marc Choubert
- P-213 **Assessment of the performances of different mechanical solid-liquid separators for pig and cattle slurries**
Paolo Balsari, Eliana Santoro, Elio Dinuccio and Fabrizio Gioelli
- P-214 **Development of an agglomeration-based technology to transform chicken manure into an user-friendly fertilizer**
Ina Körner, Henrich Roeper, Helmut Adwiraah and Rainer Stegmann
- P-215 **Electroremediation of heavy metals from liquid manure**
Jacek Dach and Dick A.J. Starmans
- P-216 **Composting of winery and distillery residues: Evaluation of the process by FT-IR**
Marhuenda-Egea, F.C., Martínez-Sabater, E., Such-Basáñez, I., Moral, R., Bustamante, M.A., Paredes, C. and Perez-Murcia, M.D.
- P-217 **Content of nutrients and trace elements in stored manure from laying hens**
Eva Salomon and Lena Rodhe
- P-218 **Availability of P and K in ash from thermal gasification of animal manure**
Gitte H. Rubæk, Peder Stoholm and Peter Sørensen
- P-219 **Co-composting of winery and distillery wastes with manure**
M.A. Bustamante, C. Paredes, R. Moral, J. Moreno-Caselles, M.D. Perez-Murcia, A. Perez-Espinosa

- P-220 **Development of a pig slurry treatment system with SBR and MBR technology**
León-Cófreces, C., García-González, M.C., Acitores, M. and Pérez-Sangrador, M.P.
- P-221 **Low temperature anaerobic digestion for swine mortalities disposal and recovery of green energy**
Daniel I. Massé, Lucie Masse, Jean-Francois Hince and Candido Pomar
- P-222 **Influence of physical characteristics during composting of the solid fraction of dairy cattle slurry**
Brito L.M., Amaro, A.L., Fernandes A.S., Trindade H. and Coutinho J.
- P-223 **Anaerobic digestion and composting of the organic fraction of municipal solid waste: process control and quality**
Marta García-Albacete, Eduardo Tolosa, Esperanza Carvajal and M.Carmen Cartagena
- P-224 **Improving the treatment of slaughterhouse wastewaters by reed bed filters**
Cristin Borda, Daniela Borda and Silvana Popescu
- P-225 **Manure management technologies in Poland: costs and environmental impacts**
Jacek Dach, Bartosz Golik, Zbyszek Zbytek and Jacek Przyby
- P-226 **Effect of natural zeolite, a slurry additive, on physicochemical slurry properties and aerial ammonia concentration in the pig farm nursery**
Dinka Milić, Alenka Tofant, Anamarija Farkaš and Jan Venglovský
- P-227 **Nutrient recovery from ash after incineration of organic residues**
Ludwig Hermann
- P-228 **Behaviour of the organic matter and related methane production during anaerobic degradation of stored slurries**
Fabien Vedrenne, Fabrice Béline and Nicolas Bernet
- P-229 **A new technology to process swine manure**
Anni Kokkonen, Erkki Aura and Risto Seppälä

Waste microbiology and bioaugmentation

Chair: A. Albiñ

- 16:15 O-17 **Behaviour of enteric micro-organisms in Canadian and French swine manure treatments**
Anne-Marie Pourcher, Nora Aktouche, Caroline Côté, Pierre Rousseau, Stéphane Godbout and José Martinez
- 16:30 O-18 **Managing manure by a greater understanding of its metabolic profile? Adopting new technologies**
Philip John Hobbs, Matt Wade, Jon Williams and Dan Dhanoa
- 16:45 O-19 **Development of Anaerobic Ammonium Oxidation (Anammox) technology using immobilized biomass from swine manure**
Matias Vanotti, Ariel Szogi, Airton Kunz and Maria Cruz Garcia Gonzalez
- 17:00 O-20 **The effect of bioaugmentation on selected microbial parameters of swine slurry pits**
Linda A. Torres-Villamizar, Roberto Reinoso, Juan. A. Alvarez, Mari Cruz García, Cristina León and Eloy Bécares

19:00 **Conference dinner**

Wednesday, September 13

08:30 Ramiran Working Group session

Reports from Ramiran working groups:

Introduction

J. Martinez

1. Heavy metals

F. Nicholson

2. Gaseous emissions

T. Misselbrook

3. Hygienic aspects

R. Böhm

4. Composting and transformation of organic wastes

M.P. Bernal

5. Management of organic wastes

G. Provolò

6. Other wastes generated on the farm

P. Balsari

7. Information technology

J. Venglovsky

10:00 *Coffee break*

Nutrient balances at the field level

Chair: F. Nicholson

- 10:30 O-21 **Strategies to reduce diffuse nitrogen pollution from cattle slurry applications**
J.R. Williams, E.Sagoo, B.J. Chambers, J. Lapworth, D.R. Chadwick and J.A. Laws
- 10:45 O-22 **Nitrous oxide emissions from riparian buffers and treatment wetlands**
Patrick G. Hunt, Terry. A. Matheny, K.S. Ro, and Ariel. A. Szogi
- 11:00 O-23 **Land application of solid and liquid fractions from sedimented dairy slurry**
S. Bittman, T.A. Forge, A. Liu, M. Chantigny, K. Buckley, C.G. Kowalenko, D.E. Hunt, F. Bounaix and A. Friesen
- 11:15 O-24 **Utilization and losses of nitrogen and phosphorus from field-applied slurry separation products**
Torkild Birkmose, Peter Sørensen and Gitte H Rubæk
- 11:30 O-25 **Uptake of cation micronutrients by wheat from two different animal manures applied to a sandy loam soil**
Claudia M.d.S. Cordovil and Fernanda Cabral

Quantifying NH₃ and GHG emissions

Chair: T. Misselbrook

- 11:45 O-26 **NH₃ and GHG emissions from a straw flow system for fattening pigs: housing, and manure storage**
Barbara Amon, Vitaliy Kryvoruchko, Martina Fröhlich, Thomas Amon, Alfred Pöllinger, Irene Mösenbacher and Anton Hausleitner
- 12:00 O-27 **Effect of littered systems on pollutant emissions in gestating sows**
Carlos Pineiro, Ana Isabel Pérez, Pilar Illescas, Gema Montalvo, Mariano Herrero, Rafael Giráldez, M^a José Sanz and Manuel Bigeriego

12:15 Lunch and posters

- 14:00 O-28 **Nitrous oxide and di-nitrogen losses following application of livestock manures to agricultural land**
Rachel Thorman, David Chadwick, Fiona Nicholson and Brian Chambers

Environmental impacts at the farm level

Chair: K. Giller

- 14:15 O-29 **Inventory of gaseous emissions (CH₄, N₂O, NH₃) from livestock manure management in France using a mass flow approach**
Armelle Gac, Fabrice Béline, Thierry Bioteau and Katell Maguet
- 14:30 O-30 **A farm-scale internet-based tool for assessing the effect of intensification on losses of nitrogen to the environment**
N.J. Hutchings, I.S. Kristensen, N. Detlefsen, B.M. Petersen and M.S. Jørgensen
- 14:45 O-31 **Ammonia concentrations around 5 farms in the Central Plateau of Spain**
M^a José Sanz, Carlos Monter, Mónica Vázquez, Francisco Sanz, Gema Montalvo, Pilar Illescas, Carlos Pineiro and Manuel Bigeriego
- 15:00 O-32 **Simulation of Odour dispersion by natural windbreaks**
Xingjun Lin, Suzelle Barrington, Jim Nicell and Denis Choiniere
- 15:15 O-33 **Comparison of models and measurements for whole-farm ammonia emissions**
T.H. Misselbrook, S.L. Gilhespy, R.E. Thorman, D. Sandars, A.G. Williams, C. Burton and R. Pinder

15:30 **Poster session incl. refreshments**

- P-301 **Nitrous oxide and methane emissions from unmanaged wet areas of intensive dairy systems**
R.A. Matthews, S. Yamulki, A.L. Retter, N. Donovan, D.R. Chadwick and S.C. Jarvis
- P-302 **Research for climate protection: technological options for mitigation (Reclip:tom)**
Barbara Amon, Martina Fröhlich, Marion Ramusch and Wilfried Winiwarter

- P-303 **Ammonia emission rates after application of slurry by different techniques in dry grasslands and arable fields in the Central Plateau of Spain**
M^a José Sanz, Carlos Monter, Roberto Antequera, Francisco Sanz, J. L. Palau, Gema Montalvo, Pilar Illescas, Carlos Pineiro and Manuel Bigeriego
- P-304 **'Beef and chips' - environmentally friendly overwintering of cattle on woodchip pads**
K.A.Smith, J.A. Laws and F.A. Agostini
- P-305 **Ammonia and greenhouse gas emissions from pig slurry – the effect of slurry fermentation, separation of the fermentation product and application technique**
Kristiina Regina and Paula Perälä
- P-306 **The effect of cow slurry fermentation and application technique on greenhouse gas and ammonia emissions from a grass field**
Paula Perälä and Kristiina Regina
- P-307 **Ammonia emissions from swine manure storage tank**
Frédéric Pelletier, Stéphane Godbout, Jean-Pierre Larouche, Stéphane P. Lemay and Alfred Marquis
- P-308 **The effect of cattle-slurry electroflotation on grassland yield**
Sergio Menéndez, Pilar Merino, Mirian Pinto, Aritz Lekuona, Laszlo Márton, Carmen González-Murua and Jose María Estavillo
- P-309 **New parameters for evaluation of environmental impacts from cattle slurry and mineral fertilizer surface-applied to grassland**
Teruo Matsunaka and Takuji Sawamoto
- P-310 **Agronomic use of exhausted grape marc composts on tomato crop: Yield, biomass production and morphological aspects**
Moral, R., Bustamante, M.A., Moreno-Caselles, J., Perez-Murcia, M.D., Perez-Espinosa, A., Paredes, C. and Ruiz, J.J.
- P-311 **Reduction in nitrate leaching for a sustainable agriculture**
Albrecht Siegenthaler and Werner Stauffer
- P-312 **Use efficiency of phosphorus applied with animal manure to organically and conventionally managed soils**
Astrid Oberson, Hans-Ulrich Tagmann, David Dubois, Paul Mäder and Emmanuel Frossard
- P-313 **Effect of time and rate of cattle-slurry application on nitrate concentration of drainage water in a double-cropping forage system**
Henrique Trindade, José Luís Pereira, João Coutinho and Nuno Moreira
- P-314 **Leaching of organic matter and metals from pig slurry before and after solid-liquid separation**
Carlos de la Fuente and María-Pilar Bernal
- P-315 **Influence of application rate and method on nitrogen losses from slurry applied to grassland**
T.H. Misselbrook, S.L. Gilhespy, S. Yamulki, V. Camp, N. Donovan, N. Bulmer, A. Retter, J. Williams, B. Chambers, E. Sagoo and R. E. Thorman
- P-316 **Nitrogen and phosphorus losses following cattle slurry applications to a drained clay soil at Brimstone Farm**
Elizabeth Sagoo, John R. Williams, Brian J. Chambers, Roy Cross, Jeff Short, Andrew Portwood and Robin A. Hodgkinson

- P-317 **Grass forage yield and soil mineral nitrogen as influenced by fertilization type and slurry application techniques**
Dolores Báez and Juan Castro
- P-318 **Fractionation of copper and lead in a soil column amended with an anaerobic municipal sewage sludge**
G. Egiarte, A. Agnelli, M. Camps Arbestain, G. Corti, E. Ruíz-Romera, M. Pinto
- P-319 **Analysis of malodorous volatile organic compounds in the air around dairy cow manure with HS/SPME GC-MS**
Joana Larreta, Haritz Arriaga, Pilar Merino, Asier Alonso, Olatz Zuloaga and Gorka Arana
- P-320 **Agricultural value of the spent mushroom substrate**
C. Paredes, R. Moral, M.D. Perez-Murcia, J. Moreno-Caselles and A. Perez-Espinosa
- P-321 **Assessment of manure management systems in Austria and improvement of the emission inventory**
Barbara Amon, Martina Fröhlich and Thomas Amon
- P-322 **Measures to decrease ammonia emission from solid manure storages**
Lena Rodhe, Gustav Rogstrand, Marianne Tersmeden and Jan Bergström
- P-323 **Nitrification activity of soil polluted with copper and zinc after intensive pig slurry application**
Vesselin Koutev, José Martinez, Gérard Guiraud and Christine Marol
- P-324 **A methodology for the sizing of slurry storages, and for measuring nutrient excretion on dairy farms**
Castro J., Novoa R., Báez D. and López J.
- P-325 **Assessment of nitrate pollution sources in pig-farms producing liquid manure (Case study)**
Csaba Juhász, Tibor Bíró, János Tamás and Elemér Kovács

16:30 **Plenum discussion and closure**

Thursday, September 14

8.00	Departure, Radisson Hotel Aarhus
8.10	Departure, Scandic Hotel Plaza, Aarhus
8.20	Departure, Hotel CabInn, Aarhus
9.00 – 09.45	InFarm A/S, Haslundkærvej, Randers (slurry acidification)
10.20 – 11.05	Kemira Miljø A/S & BioScan A/S, Højmarken, Randers (separation, presentation of separation+centralized AD concept)
11.30 – 12.10	Guided (bus)tour at Danish Institute and Agricultural Sciences, Foulum, introduction to new biogas research facility
12.15 – 13.15	Lunch at Danish Institute and Agricultural Sciences, Foulum
13.45 – 14.30	Lake restauration project at the scenic Lake Hald
14.45 – 15.15	Coffee at "Niels Bugges Inn"
15.15	Departure
16.30	Arrival at Aarhus Central Station



Each year Danish farmers handle 34 million tonnes of animal manure, which is applied to fields. There is much focus on the environmental impact and nutrient use efficiency of animal manure and other residues in the public debate and in the scientific and industrial sectors, and this is already reflected in the legislation.

However, increasing demands for an environmental friendly livestock production are anticipated in the future. In order to fulfil these demands both farmers and industry have an interest in better coordination of the resources spent on research and technological development. To achieve this, the Danish Institute of Agricultural Sciences has founded the **Knowledge Centre of Animal Manure and Biomass Technology**.

The centre will both collate the existing knowledge and launch new scientific projects and ideas to ensure that both the scientists, the authorities, and the industrial sector through cooperation and a holistic research approach bring the resources to the best possible use.

The Knowledge Centre operates in close cooperation with scientists, research institutions, and companies within the manure and biomass treatment sector – and with governmental authorities and farmers.