

11th European Conference on Precision Livestock Farming (ECPLF 2024)

Bologna, Italy
9 - 12 September 2024

Volume 1 of 3

Editors:

D. Berckmans
P. Tassinari
D. Torreggiani

ISBN: 979-8-3313-0354-9

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2024) by The Organising Committee of the 11th European Conference on Precision Livestock Farming (ECPLF). All rights reserved.

The individual contribution in this publication and any liabilities arising from them remain the responsibility of the authors.

Printed with permission by Curran Associates, Inc. (2024)

For permission requests, please contact The Organising Committee of the 11th European Conference on Precision Livestock Farming (ECPLF) at the address below.

The Organising Committee of the 11th European Conference on Precision Livestock Farming (ECPLF)
University of Bologna
Bologna, Italy

EA-PLF SECRETARIAT

C/O MV Congressi - Via Marchesi 26/d, 43126 Parma, Italy
Phone: +39 0521 290191 / ext. 43 - Fax: +39 0521 291314 - Mail: secretariat@eaplf.eu
<http://www.eaplf.eu/>

CONFERENCE SECRETARIAT

Via Orefici n. 4 - 40124 Bologna - Italy
Phone: +39 051 230385 - Mail: info@noemacongressi.it - www.noemacongressi.it

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

SESSION 1 - COWS MONITORING

| | |
|---|-----------|
| Exploring the link between cow size and sideways lunging using 3D pose estimation | 32 |
| <u>Adrien Kroese</u> , Niclas Högberg, David Berthet, Lena-Mari Tamminen, Nils Fall, Moudud Alam | |
| Video methodology for automated analysis of livestock feeding behaviour in indoor settings | 40 |
| <u>Georgina Wager</u> , Matthew Butler, W. Edwin Harris, Mark Rutter, Emma Bleach, James McCaughern, Karl Behrendt | |
| Development of a customized network system for cow tracking and positioning | 48 |
| <u>Marco Bovo</u> , Elia Favarelli, Andrea Giorgetti, Daniele Torreggiani, Patrizia Tassinari | |
| Improving animal health and welfare by using sensor data in herd management and dairy cattle breeding – a joint initiative of ICAR and IDF | 56 |
| Christa Egger-Danner, Ilka Klaas, Luiz Brito, Katharina Schodl, Jeffrey Bewley, Victor Cabrera, Marie Haskell, Michael Iwersen, Bjorg Heringstad, Kathrin Stock, Anna Stygar, Miel Hostens, Nicolas Gengler, René van der Linde, Nouredine Charfeddine, <u>Elsa Vasseur</u> | |
| A direct comparison of two RTLS for dairy cows | 64 |
| <u>Christiane Engels</u> , Maria Trilling, Wolfgang Büscher | |

SESSION 2 - COWS MILK & LACTATION

| | |
|--|------------|
| Impact of microclimatic conditions on dairy cows' milk production in an Automatic Milking System: evaluating trends and predictive modeling | 74 |
| <u>Marco Zanchi</u> , Caterina La Porta, Claudio Forte, Stefano Zapperi, Laura Ozella | |
| Effect of clinical mastitis on the magnitude and time of the nadir body condition score during early lactation of Holstein cows | 82 |
| Pablo Pinedo, <u>Diego Manriquez</u> , Joaquin Azocar, Albert De Vries | |
| Comparative Assessment of Lactation Models for Evaluating Herd Productivity: Classical model and Machine Learning techniques | 89 |
| <u>Lucia Trapanese</u> , Angela Salzano, Nicola Pasquino, Miel Hostens | |
| Time series clustering on PLF data from milking systems to understand the pattern on udder health related traits in milk before cow dry-off | 97 |
| <u>Fabio Abeni</u> , Stefania Barzaghi, Rosanna Marino, Francesca Petrera | |
| Association between AI generated milk yield residuals as measure of transition success and behavioural patterns in dairy cows | 104 |
| <u>Celien Kemel</u> , Matthieu Salamone, Ben Aernouts, Ines Adriaens, Peter Hut, Miel Hostens, Geert Opsomer | |

SESSION 3 - PIGS ACTIVITY & BEHAVIOUR

- Developing an algorithm to monitor fattening pig welfare at group level: the approach proposed by the ClearFarm project** 114
Heng-Lun Ko, Yaneth Gómez Herrera, Ester Jara-Lorente, Natàlia Blasco-Andreo, Artemis Llabrés-Brustenga, Kevin Chow, Joan Serra-Sagrasta, Xavier Manteca, Pol Llonch
- Area-specific vocalisation and activity monitoring in pigs** 120
Nick Westendorff, Birger Puppe, Liza Moscovice, Beryl Eusemann, Christian Man-Teuffel
- Can we breed for better social behaving pigs, based on feeder station data?** 128
Øyvind Nordbø, Kristine Hov Martinsen
- Pulling the rope - predicting tail biting in pigs with the Bite-o-Mat** 136
Josefine Eisermann, Helen Schomburg, Sophie Diers, Heiko Janssen, Lisa Küstner, Astrid van Asten, Lars Schrader, Antonia Patt
- Study on pig vocalization classification method based on multi-feature fusion** 144
Ligen Yu, Yuting Hou, Yu Liu, Chaoyuan Wang, Xiaoli Ding, Qifeng Li

SESSION 4 - POULTRY BEHAVIOUR

- Identifying the optimal optimization strategy for autoencoders intended for monitoring of poultry audio data** 154
Dan Jensen, Lea Olsen
- Development of automated sound indicator measurements for the early detection of respiratory disorders in poultry: the case of Infectious Bronchitis** 161
Pauline Créach, Nicolas Pajusco, Bruno Brouard, Laurent Simon, Mickaël Riou, Mohammed Eljabri, Elodie Doutart, Ayoub Khoumane, Angélique Travel
- Identification of four types of vocalization through sound analysis in broiler chickens** 170
Patricia Soster, Tomasz Grzywalski, Pieter Thomas, Yuanbo Hou, Paul Devos, Dick Botteldooren, Annelike Dedeurwaerder, Maarten De Gussem, Frank Tuytens, Gunther Antonissen
- Optimising barn management: Accurate data extraction for enhanced Animal behaviour analysis using an analytical tool** 175
Gurubaran Raveendran, Sören Meyer zu Westerhausen, Johanna Wurst, Jessica Raabe, Thomas Bartels, Kai Homeyer, Roland Lachmayer
- Chicken run - Individual activity patterns of growing dual-purpose chickens in their home pen** 183
Inga Tiemann, Senta Becker, Pia Schürmann, Anna Lea Bühring, E. Tobias Krause, Wolfgang Büscher, Lars Schrader

SESSION 5 - PLF & EMISSIONS 1

Greenhouse Gas Flux Dynamics in Central Italy's Mountain Ecosystems: Effects of Grazing, Abandonment, and Burning 190

Raffaello Spina, Giampiero Grossi, Riccardo Primi, Andrea Vitali, Simone Priori, Bruno Ronchi, Pier Paolo Danieli, Paolo Viola

Modelling methane production of dairy cows: A hierarchical Bayesian stochastic approach 198

Cécile Levraut, Nico Ogink, Jan Dijkstra, Fred van Eeuwijk, Peter Groot-Koerkamp, Kelly Nichols, Carel Peeters

Innovative pig house designs for minimal emissions: impact of manure management on methane and ammonia emissions 206

Paria Sefeedpari, André J.A. Aarnink

A comparison of two methods for the ventilation rate estimation of a naturally ventilated buffalo barn 214

Alessandra Apostolico, Ester Scotto di Pertà, Elena Cervelli, Raffaele Grieco, Antonio Mautone, Tomas Norton, Stefania Pindoizzi

SESSION 6 - COWS HEALTH & DISEASE DETECTION 1

Fever detection in calves using wearable physiological data 224

Alberto Pena Fernandez, Florian Debruyne, Glenn Van Steenkiste, Jade Bokma, Stan Jourquin, Thomas Lowie, Justine Clinquart, Bart Pardon, Daniel Berckmans

Thermal imaging for foot health classification of dairy cattle 232

Pieter-Jan De Temmerman, William Davy, Désirée Maryns, Annelies Van Nuffel, Geert Opsomer, Jarissa Maselyne, Simon Cool, Stephanie Van Weyenberg

Assessing the effects of sensor-based health monitoring procedures in early lactation on animal health, performance, and surveillance traits on a Holstein dairy farm 240

Felix König, Andrew Hancock, Christian Wunderlich, Marcus Klawitter, Thomas Breuer, Anne Simoni, Karina Weimar, Marc Drillich, Michael Iwersen

Integrated use of data to improve dairy cow's health and welfare 249

Giulia Gislon, Maddalena Zucali, Luciana Bava, Serena Bonizzi, Marta Pavolini, Anna Sandrucci

Integrating genomics and phenomics data for the early detection of subclinical ketosis in dairy cows 258

Rafael Ferreira, Maria Angels de Luis Balaguer, Ranveer Chandra, Guilherme Rosa, Joao Dorea

SESSION 7 - COWS OESTRUS TO PARTURITION

Cattle breeding digitalisation: proximity sensors for oestrus detection under grazing conditions 268

Manuel Jesús García García, Francisco Maroto-Molina, Eseró Padrón-Tejera, Dolores C. Pérez-Marín

| | |
|---|------------|
| Skeleton-based computer vision algorithms for detecting behavior of dairy cows prior to calving | 276 |
| <i>Mathias Gosch, Maciej Oczak, Nick Hockings, Christian Guse, Michael Iwersen</i> | |
| Use of deep learning algorithms to evaluate luteal color Doppler ultrasonography as an alternative method of pregnancy diagnosis in cattle | 284 |
| <i>Lucas M. Goncalves, Pedro L. P. Fontes, <u>Anderson A. C. Alves</u></i> | |
| Development of a calving detection model based on behaviors from an accelerometer collar device in dairy cows | 292 |
| <i>Milos Kosanovic, Jelena Jakimov, Dragan Stojanovic</i> | |
| The Cowtech Project: a module for cow oestrus detection in free stall barns by LoRaWAN services | 300 |
| <i>Marco Bonfanti, Dominga Mancuso, Simona Porto, Giovanni Cascone, Kevin La Terra, Giuseppe Azzaro, Margherita Caccamo</i> | |
| SESSION 8 - COMPUTER VISION PIGS BEHAVIOUR | |
| Tail biting in pigs: event and biter detection via automatic audiovisual analysis | 310 |
| <i>Philipp Hesecker, Tjard Bergmann, Marina Scheumann, Ulrich Hartmann, Imke Traulsen, Nicole Kemper, Jeanette Probst</i> | |
| Intelligent recognition of live pig aggregation behavior based on convolutional neural network | 318 |
| <i>RuoXin Peng, <u>Chao Liang</u>, PeiGuang Xin</i> | |
| Noisy-student piglet detection - An approach for the automatic data generation to increase object detection performance | 327 |
| <i>Martin Wutke, Clara Lensches, Ulrich Hartmann, Imke Traulsen</i> | |
| Pig Behaviour Classification using CRNN | 335 |
| <i>Andrea Parmiggiani, Dong Liu, Tomas Norton</i> | |
| Tail Posture as a Predictor of Tail Biting in Pigs: A Camera-Based Monitoring System | 341 |
| <i>Jan-Hendrik Witte, Philipp Hesecker, Jeanette Probst, Imke Traulsen, Nicole Kemper, Jorge Marx Gómez</i> | |
| SESSION 9 - POULTRY BEHAVIOUR & PRODUCTION | |
| Application of passive RFID to monitor the feeding behaviour of broilers | 350 |
| <i>Rudi de-Mol, Stephanie Melis, Henk Gunnink, Marijn Overbeeke, Ingrid de Jong</i> | |
| Towards an adaptive expert-in-the-loop algorithm for early detection of problems in laying hen flocks | 358 |
| <i>Lara van Veen, Henry van den Brand, Anna van den Oever, Bas Kemp, Ali Youssef</i> | |
| Predicting broiler gait score at flock level using behavioral and performance data | 366 |
| <i>Xiao Yang, Chaoyuan Wang, Ligen Yu</i> | |

LED Arrays to Reduce Poultry Piling 374
Daniel Morris, Yunfei Long, Ahmed Ali, Janice Siegford

Mitigating heat stress in broiler houses using energy balance analysis 382
Kehinde Favour Daniel, Lak-yeong Choi, Jinseon Park, Ji-yeon Park, Chae-rin Lee,
Se-yeon Lee, Sewoon Hong

SESSION 10 - PLF IMPLEMENTATION & ACCEPTANCE

Application and Development of Precision Livestock Farming Technologies to Improve Transparency in Pig Husbandry – A Systematic Literature Review Using PRISMA 392
Anoma Gunarathne, Philipp Hölscher, Christina Umstätter, Joanna Stachowicz

Precision Livestock Farming in the U.S. swine industry: farmer intention to adopt, actual adoption practices and veterinarian recommendations to adopt 400
Babatope Akinyemi, Simon Turner, Faical Akaichi, Anna Johnson, Madonna Benjamin, Monique Pairis-Garcia, Dale Rozeboom, Juan Steibel, David Thompson, Casey Zangaro, Lesley Jessiman, Janice Siegford

United States public's attitudinal acceptance of precision livestock farming technologies in the swine industry 409
Babatope Akinyemi, Janice Siegford

Survey results of swine production across the globe 418
Shiva Paudel, Tami Brown-Brandl, Brett Ramirez, Rafael Vieira de Sousa, Thomas Banhazi, Tomas Norton

Unlocking the Potential of Precision Livestock Farming Data: A Three-Step Approach for Interface Identification using the Example of the German Pig Value Chain 426
Hauke Precht, Cedrik Theesen, Jorge Marx Gómez

SESSION 11 - COMPUTER VISION COWS 1

Reading ear-tags from a live-stream for real-time animal identification 436
Ina Hulsegge, Marjaneh Taghavi, Claudia Kamphuis

A non-invasive cattle identification for precision livestock farming 444
Anna Chlingaryan, Shuchang Ye, Michael Patching, Cameron Clark

Real time identification of individual dairy cows through computer vision 452
Claudia Giannone, Marco Bovo, Mattia Ceccarelli, Stefano Benni, Patrizia Tassinari, Daniele Torreggiani

Development of a tracking-by-classification method for identifying and tracking Holstein cows in a free-stall barn environment 459
Boris Zandona, Meiqing Wang, Sumin Li, Xiaoqi Ma, Susanna Räisänen, Aira Maye Serviento, Zhibo Zeng, Yixin Zhang, Xinjie Zhao, Mutian Niu

| | |
|--|------------|
| Siamese Networks for identification of Holstein cattle during growth and across different physiological stages | 467 |
| <i>Ariana Negreiro, Anderson A. C. Alves, Rafael Ferreira, Guilherme Menezes, Enrico Casella, Tiago Bresolin, Guilherme Rosa, Joao Dorea</i> | |

SESSION 12 - COWS HEAT STRESS

| | |
|---|------------|
| A case study on the effect of extended heat stress windows and the behavioral response of dairy cows | 476 |
| <i>Daniela Lovarelli, Giuletta Minozzi, Francesco Tiezzi, Marcella Guarino</i> | |

| | |
|--|------------|
| Changes in data from automated milk feeders in dairy pre-weaned calves with regard to heat stress | 484 |
| <i>Daniela Klein-Jöbstl, Malina Flessner, Christian Guse, Jose Chapa, Michael Iwersen</i> | |

| | |
|---|------------|
| Effects of heat stress on the activity of calves | 489 |
| <i>Malina Flessner, Christian Guse, Jose Chapa, Felipe Penagos Tabares, Michael Iwersen, Daniela Klein-Jöbstl</i> | |

| | |
|--|------------|
| Milk yield and behavioural changes during a hot period on a commercial dairy farm | 496 |
| <i>Judith Roelofs, Ariette van Kneysel, Elaine van Erp - van der Kooij</i> | |

| | |
|---|------------|
| HoliCow – tool and global decisions to detect resilient heat stress cows | 504 |
| <i>Laura M. Dale, Julie Leblois, Pauline Lemal, Clément Grelet, Michael Lynch, Nicolas Gaudilliere, Marine Gele, HoliCow Consortium, Andreas Werner, Hélène Soyeurt</i> | |

SESSION 13 - PIGS DRINKING & FEEDING BEHAVIOUR

| | |
|--|------------|
| Evaluation of an image classifier for estimating feed intake and feeding behavior in weaned piglets | 514 |
| <i>Thomas Van De Putte, Céline Van Kerschaever, Miel Hostens, Jeroen Degroote</i> | |

| | |
|---|------------|
| Detection of undesired events in finisher pigs with water usage and weather data | 522 |
| <i>Mariska van-der-Voort, Dan Jensen</i> | |

| | |
|---|------------|
| Identification of aberrant drinking behaviour of grow-finishing pigs | 530 |
| <i>Sudhendu Sharma, Tami Brown-Brandl, Kuljit Bhatti, Gary Rohrer</i> | |

| | |
|--|------------|
| Identifying heat stress patterns in tunnel and naturally ventilated systems | 538 |
| <i>Felipe Picchi, Brett Ramirez</i> | |

| | |
|--|------------|
| Growth performance insights of fattening pigs in view of better PLF | 546 |
| <i>Pol Llagostera, Lluís Miquel Pla, Pau Font, Joan Cartanyà, Daniel Babot</i> | |

SESSION 14 - DATA ANALYSIS MODELLING

| | |
|--|------------|
| Cross-species knowledge sharing for improved animal activity recognition with limited labelled data | 556 |
| <i>AXIU MAO, Meilu Zhu, Endai Huang, Zhaojin Guo, Zheng He, Li Lyu, Tomas Norton, Kai Liu</i> | |

An Internet of Things system to monitor environmental conditions in livestock housing 563
Giorgio Provolo, Carlo Brandolese, Matteo Grotto, Augusto Marinucci, Nicola Fossati, O. Ferrari, E. Beretta, Elisabetta Riva

Advancing precision livestock farming through ontology-driven interoperable health data management: Extending the Livestock Health Ontology (LHO) for enhanced disease surveillance 571
Saba Noor, Miel Hostens, Jeroen Degroote, Beatriz Garciam, Gerdien van Schaik, Bart Pardon, Jade Bokma, Yara Slegers

A sensor to measure cattle vocalisations for welfare monitoring at the slaughterhouse 581
Joana Miranda, Amaia Hormaetxe, Cristian Larrondo, Raúl David Guevara, Marc Freixes, Ester Vidaña-Vila, Rosa Maria Alsina, Leticia Duboc, Pol Llonch, Eva Mainau

Advancing pig traceability at a Norwegian slaughterhouse: a six-month evaluation of automated tattoo reading 589
Andrea Capobianco Dondona, Alberto Tiburzi, Simon Danny Pettinella, Lorenzo Schirotti, Elizaveta Golunova, Mohammad Danish, Ercole Del Negro

SESSION 15 - HORSES

Automated Pain Recognition in Horses from Facial Images 598
Marcelo Feighelstein, Emanuela Dalla Costa, Claudia Spadavecchia, Marta Comin, Anna Zamansky

Effects of chiropractic on horse welfare: a pilot study using smart technologies 605
Beatrice Benedetti, Francesca Freccero, Manuela Piscopiello, Martina Felici, Maria Gaia Angeloni, Aurora Mannini, Martina Zappaterra, Ilaria Arena, Barbara Padalino

Hierarchical models to account for uncertain identification in precision livestock farming and phenotyping 614
Mina Shumaly, Juan Steibel, Santosh Pandey

Utilizing GPS devices and remote sensing data to characterize grazing patterns and terrain occupancy of Hispano-Breton mares in the Spanish Pyrenees 622
Javier Plaza, Nilda Sánchez, Jose Alfonso Abecia, Jaime Nieto, Francisco Canto, María Elena Pérez-García, Carlos Palacios Riocerezo

SESSION 16 - COWS / CATTLE BEHAVIOUR

Development of a digital tool for monitoring the behaviour of pre-weaned calves using accelerometer neck-collars 632
Oshana Dissanayake, Sarah E. McPherson, Joseph Allyndrée, Emer Kennedy, Pdraig Cunningham, Lucile Riaboff

Personality traits of dairy cows: relationship between boldness and habituation to robotic milking to improve precision and efficiency 640
Martina Lamanna, Giovanna Marliani, Giovanni Buonaiuto, Damiano Cavallini, Pier Attilio Accorsi

The influence of genetic relatedness on dairy cows' social behavior in Automatic Milking Systems 648
Riccardo Moretti, Laura Ozella, Stefania Chessa, Enrico Ponzo, Fernando Masia, Elisa Vrieze, Paola Sacchi

Features of 24-h behavioural patterns of dairy herds in relation to milking system, pasture access and season 656
Lianzhe shi, Ariette van Knegsel, Akke Kok

Analysing the social network dynamics of dairy cows with computer vision 665
Laura Ozella, Davide Vitturini, Elena Diaz Vicuna, Marco Bovo, Claudio Forte, Mario Giacobini, Marco Grangetto

SESSION 17- GRAZING COWS 1

Potential for measuring grazing spatial evenness with GNSS tracking collars 676
Eseró Padrón-Tejera, Francisco Maroto-Molina, Manuel Jesús García García, Dolores C. Pérez-Marín

Designing a new method using both inertial measurement unit (IMU) and satel-lite-based position sensor with real-time kinematics correction (RTK GNSS) for the study of grazing cows' behaviors 684
Nicolas Tilkens, Jerome Bindelle, Isabelle Dufrasne, Jeroen Meersmans, Bossima Ivan Koura, Hang Shu, Paulo César De Faccio Carvalho, Ali Siah, Andriamasinoro Lalaina Herinaina ANDRIAMANDROSO

Differences in water consumption and temperament of young Nelore and Canchim bulls raised on tropical pastures revealed by electronic monitoring 692
Alexandre Rossetto Garcia, Alda Juliana de Castro Sousa, Andréa do Nascimento Barreto, Edilson da Silva Guimarães, Alberto Carlos de Campos Bernardi, Cintia Righetti Marcondes, José Ricardo Macedo Pezzopane, Gabriela Novais Azevedo, Vinícius Rosendo Piloto, Rubens Paes de Arruda

Behavior recognition of grazing cattle with multi-sensor data based on edge intelligent computing 701
Luyu Ding, Yang Lv, Mingyu Li, Zhuo Li, Zhiwei Cheng, Jiaxin Guo, Qifeng Li

Localization of grazing cows using Yolov8 object detection and known landmarks 709
Jérémie Haumont, Pieter-Jan De Temmerman, Jürgen Vangeyte, Jarissa Maselyne

SESSION 18 - COWS FEEDING & DRINKING

Real-time facial identification of Jersey cows using an edge computing device 720
Li Lyu, Mahejabeen Hossain Nidhi, Zhaojin Guo, Zheng He, Kate Jade Flay, Kai Liu

The diversity in dairy cattle reticulorumen temperature: Identifying water intake events 728
Alice Shirley, Peter Thomson, Anna Chlingaryan, Cameron Clark

Utilizing Computer Vision for Beef Cattle Feeding Bunk Score Assessment with a Calan Gate Feeding System 737
Egleu D. M. Mendes, Jack Wooley, Yalong Pi, Jian Tao, Luis O. Tedeschi

An attempt to predict feed intake of dairy cows using RGB images 746
Jeffrey Zweidler, Meiqing Wang, Sumin Li, Boris Zandona, Susanna Räisänen, Aira Maye Serviento, Mutian Niu

Modelling reticulorumen temperature change from drinking events using Richmann's Law 754
Md Shaheenur Rahman, Peter Thomson, Anna Chlingaryan, Rafiq Islam, Angela Lees, Cameron Clark

SESSION 19 - IMPLEMENTATION & NOVEL APPLICATIONS

Feeding the future: Prospects of in ovo feeding for more efficient poultry production 764
Zehava Uni, Jonathan Dayan

Digital technology adoption trends among French ruminant farmers: a 2023 survey analysis 772
Estelle Nicolas, Clément Allain, Alisson Stocchetti

Bee Mite detection in crowded scenes 780
Andrea Parmiggiani, Dong Liu, Tomas Norton

Validation and calibration procedure for monitoring system: an aquaculture application 787
Mattia Ceccarelli, Alberto Barbaresi, Enrica Santolini, Marco Bovo, Daniele Torreggiani

Development and Implementation of a Precision Livestock Farming System 793
Tami Brown-Brandl, Sudhendu Sharma, Gary Rohrer, Brittney Keel, Elliott Denni

SESSION 20 - VENTILATION AND MICROCLIMATE

Investigation on the effects of the application of targeted ventilation system in farrowing houses in summer 802
Longhuan Du, Tianbao Chen, Zhiping He, Chaowu Yang, Xuan Tao, Luyao Guo, Ziqianhong Wan, Min Fu, Yunfeng Lei

Effect of different ventilation systems on behavior and welfare of undocked pigs 810
Marika Vitali, Enrica Santolini, Marco Bovo, Patrizia Tassinari, Daniele Torreggiani, Paolo Trevisi

CFD models for the evaluation of natural ventilation in dairy barns: simplified versus refined 818
Enrica Santolini, Marco Bovo, Patrizia Tassinari, Daniele Torreggiani, Alberto Barbaresi

Examining Air Quality Dynamics in Dairy Farm Milking Parlor and Tunnel-Ventilated Barn Using Automated Sensors 826
Diego Manriquez, Afrin Jannat

SESSION 21 - COWS WELFARE

Automatic monitoring of body temperature in dairy cows using implanted sensors 836

Elaine van Erp - van der Kooij, Nina Leenders, Judith Roelofs

Automated recording of cow brush visits in a commercial dairy farm setting 844

Gerben Hofstra, Femke Donkers, Maelisse Houibert, Mark Terlien, Judith Roelofs, Lenny van Erp-van der Kooij

Predicting sleep events in dairy cows by machine learning using respiratory rate and 3D accelerometer data 853

Chris Major Ncho, Xinjie Zhao, Susanna Räisänen, Meiqing Wang, Aira Maye Serviento, Rong Peng, Zhibo Zeng, Emma Ternman, Mutian Niu

Automatic milking systems data reveal that presence of strangers in the farm is stressful for cows 863

Angela Costa, Giulio Visentin, Ludovica Mammi, Damiano Cavallini, Alberto Palmonari, Riccardo Colleluori, Andrea Formigoni

SESSION 22 - COWS FEEDING

Growth and metabolism responses differ in male and female Holstein dairy calves born to cows fed different energy levels in late lactation to influence body condition scores at dry-off 872

Elizabeth French, Thiago Cunha, Laura Hernandez

Optimizing agricultural sustainability: a multi-objective approach for crop rotation and diet formulation in dairy farms under European Common Agricultural Policy (EU CAP) 881

Yijing Gong, Andrea Bellingeri, Francesca Fumagalli, Gian Simone Sechi, Alberto Stanislao Atzori, Francesco Masoero, Antonio Gallo, Victor Cabrera

FeMIR - MIR Spectral predictions for feed and energy efficiency Practical Application 889

Laura M. Dale, Anna Al Baqain, Clément Eck, Mathilde Aresi, Andreas Werner, ResKuh Consortium, MissionCow Consortium, ReMissionDairy Consortium, Carmen Natterer, Jürgen Bieger, Elisa J.P. Strang

Exploring Milk Productivity and Energy Output Dynamics across Lactation Periods in Automatic Milking Systems through Multi-Algorithm Clustering 897

Karina Brotto Rebuli, Laura Ozella, Fernando Masia, Elisa Vrieze, Mario Giacobini

Use of Progeo Dairy Manager (PDM) software to assess precision during preparation of TMR mixing wagon 907

Simone Silvestrelli, Damiano Cavallini, Jenny Bongiovanni, Fausto Toni, Andrea Formigoni

SESSION 23 - PIGS SOUND

Assessing the Robustness of Pig Cough Detection Models to Changes in Farm Conditions 916

Sreenivasa Upadhyaya, Wim Buyens, Wim Desmet, Peter Karsmakers

| | |
|--|------------|
| PLF Technologies that provide improved leading indicators of growing pig health, welfare and performance | 924 |
| <u>Dale Polson</u> , Carmen Alonso | |
| Potential optimization of antibiotic use in nursery piglets based on analysis of data comparing the use of sound monitoring of respiratory health status and seasonal mortality | 933 |
| <u>Fabian Erusalimsky</u> , Erik Vranken, Wim Buyens, Dries Berckmans, Alvaro Jorge Peñas, Sebastian Figueras, Teresa Guiu, Carmen Alonso | |
| Economic assessment of a sound-based monitoring tool to drive early intervention against respiratory diseases under commercial conditions | 941 |
| <u>Carmen Alonso</u> , Boris Alonso, Francisco Gonzalvo, Eugenio Sanchez, Gloria Abella | |
| Global epidemiology of respiratory health status in swine growing populations sound-monitored: A 1-year observational retrospective data base study | 946 |
| <u>Carmen Alonso</u> , Dale Polson | |

SESSION 24 - COMPUTER VISION POULTRY

| | |
|--|------------|
| Optimizing Poultry Weight Management with Difference Sequence Method and Advanced Computer Vision: A Case Study from a Large-scale Hungarian Poultry Farm | 954 |
| <u>Gergo Toth</u> , Sandor Szabo, Sandor Kovacs, Marta Alexy | |
| Development of imaging tracking algorithms for the automatic recording of welfare indicators of broiler on farm | 962 |
| <u>Pauline Créach</u> , Sylvain L'Hermite, Pascal Galliot, Didier Concordet | |
| Monitoring individual behaviours of broilers using AI vision technology | 971 |
| <u>Theo Demmers</u> , Haneen Shanableh, Samantha Green | |
| Enhancing Thermal Comfort Assessment in Day-Old Broilers: A Cluster Index Approach Utilizing Computer Vision Techniques | 979 |
| <u>Cui Gao</u> , Mina Mounir, Özge Günaydin, Fien Vanlerberghe, Eduardo Romanini, Hilke Willemsen, <u>Tomas Norton</u> | |
| Predictive Precision: AI Histology for Preventing Breast Muscle Myopathy and Food Loss | 987 |
| <u>Jonathan Dayan</u> , Noam Goldman, Orna Halevy, Zehava Uni | |

SESSION 25 - PLF HUMAN & MANAGEMENT

| | |
|---|-------------|
| A Human-centric Design Approach to PLF Product Development: Case Study of Small-Scale Agroforestry Farms | 994 |
| <u>Michael Odintsov Vaintrub</u> , Pierfrancesco Di Giuseppe, Ilaria Mariani, Marzia Mortati | |
| Students' Knowledge of and Attitudes Toward Dairy Production | 1002 |
| <u>Heather Akin</u> , Babatope Akinyemi, <u>Tami Brown-Brandl</u> , Julia McQuillan | |

Optimizing swine facility management with real-time anomaly detection methods 1010
Felipe Picchi, Brett Ramirez, Somak Dutta, Bufe Guo

Continuous monitoring of the physical load for humans and animals 1018
Alberto Pena Fernandez, Adeliën Malisse, Daniel Berckmans

Continuous monitoring of the individual metabolic energy balance via wearables for humans and animals 1027
Alberto Pena Fernandez, Adeliën Malisse, Daniel Berckmans

SESSION 26 - COWS HEALTH & DISEASE DETECTION 2

Innovative Off-Body Monitoring of Dairy Calves' Vital Signs for Early Disease Detection: A Thermal Imaging Approach 1038
Maha Yousfi, Maud Janssen, Marjolein Derks, Rik van der Tol

Validity of rumination-based health alerts in early lactation 1046
Anne Simoni, Felix König, Karina Weimar, Andrew Hancock, Christian Wunderlich, Marcus Klawitter, Thomas Breuer, Michael Iwersen

Provision of automatic milking-system alerts for potential incidence of mastitis: a comparative study between stationary classification and time-series regression modelling 1054
Junsheng Zhu, Elsa Vasseur, Kevin Wade

Prototyping a PLF system in real-time 1062
Thomas Andersen, Anne Mette Kjeldsen, Jørgen Nielsen, Lars Arne Hjort Nielsen

Automatic monitoring of calves' behaviour for prediction of health and growth performance 1069
Riccardo Colleluori, Lucia Zambianchi, Angela Costa, Andrea Formigoni, Ludovica Mammi

SESSION 27 - GRAZING COWS REMOTE MONITORING

Validation of an in-field weigh station for recording cattle liveweight 1078
Faysal Mehedi Hasan, Cameron Clark, Peter Thomson, Anna Chlingaryan, Rafiq Islam, Sabrina Lomax

Automated cattle segmentation from UAV-based LiDAR point clouds 1086
Yaowu Wang, Sander Mûcher, Wensheng Wang, Lammert Kooistra

Re-learning process in dairy cows pastured with virtual fencing system 1094
Andrea Confessore, Chiara Aquilani, Valentina Cecchini, Simona Rainis, Stefano Bovolenta, Carolina Pugliese

Automated airborne monitoring of livestock using autonomous uninhabited aerial vehicles with vision-based remote sensing 1100
Kaya Kuru, Darren Ansell, David Jones, Benjamin Watkinson, John Michael Pinder, John Anthony Hill, Eden Muzzall, Claire Tinker-Mill, Kerry Stevens, Andrea Gardner

SESSION 28 - COMPUTER VISION PIGS POSTURE MONITORING

- DeMVpp-YOLO: A lightweight pig behaviour detection model for improving pig health management in farrowing pens** 1110
Zhaojin Guo, Li Lyu, Zheng He, Guo Chuanyi, Axiu Mao, Endai Huang, Kai Liu
- Synthetic Data as an optimisation tool for Pose Estimation in pigs** 1118
Sarah Juarez, Nick Hockings, Shromm Gaid, Maciej Oczak
- Real-time Pose Estimation for Suckling Piglets Using Affordable Surveillance Cameras** 1126
Zheng He, Guo Chuanyi, Zhaojin Guo, Li Lyu, Axiu Mao, Endai Huang, Kai Liu
- Sow Confinement and Piglet Safety: can PLF sort out the welfare dilemma?** 1134
Francesca Menegon, Haiming Gan, Guido Di Martino, Annalisa Scollo, Aoshen Sun, Yueju Xue, Tomas Norton
- Evaluation of alternative farrowing pen layouts** 1142
Verônica Pacheco, Tami Brown-Brandl, Luciane Martello, Rafael Vieira de Sousa, Sudhendu Sharma, Gary Rohrer

SESSION 29 - POULTRY MICROCLIMATE

- Effects of a twin shell building and proactive ventilation on energy and water expenditure in a broiler barn** 1152
Stephanie Schäfers, Nicole Kemper
- Odour Characterisation of Poultry Red Mites by TD-GC-MS: Potential Application for Early Detection and Monitoring of Infestations in Commercial Laying Hen Farms** 1158
Pascal Deenekamp, Joris Meurs, Simona Cristescu
- Effects of an automatic forced ventilation system on air temperature and litter humidity in turkey barns** 1166
Stephanie Schäfers, Nicole Kemper
- Revised Gini coefficient a new index to evaluate the environmental parameter distribution in poultry buildings** 1171
Mengwei Zhao, Pan Xiao, Chao Liang, Chaoyuan Wang
- Performance of a Rail-Mounted Robot in a Southeast U.S. Broiler House** 1179
Shawn Hawkins, Robert Burns, Yang Zhao, Tom Tabler, Tanner Thornton

SESSION 30 - SHEEP & GOATS

- Assessment of Preprocessing Factors Impacting the Prediction of Goat Behavior from Accelerometer Data** 1188
Daniel Alexander Mendez, Blanca Fajardo, Jose Manuel Calabuig Rodriguez, Fernando Estellés, Arantxa Villagrà, Salvador Calvet Sanz

Identification of the best body regions for measuring superficial skin temperature (SST) in Dairy Goats exposed to thermal stress 1194
Naod Thomas Masebo, Marilena Bolcato, Martina Zappaterra, Valeria Bocchi, Barbara Padalino, Leonardo Nanni Costa

Determination of soil carbon content in two contrasting rangeland managements through remote sensing in Chilean Patagonia 1202
Sergio Radic-Schilling, René Munoz, Susana Valle, Paulo Corti, Cinthya Glucevic, Mirna Navarro, Danitza Ruiz, Camila Naguelquin, Rodrigo Allende, Manuel Gonzalez Ronquillo

The impact of a “smart water trough” on a sheep and goats smallholder farm 1208
Alon Bar-Shamai, Ilan Shimshoni, Assaf Godo, Joseph Lepar, Tzach Glasser, Claire Morgan-Davies, Jitka Janová, Ilan Halachmi

SESSION 31 - COMPUTER VISION COWS 2

Correcting animal posture for better high-throughput phenotyping of dairy cow morphology 1218
Audrey Tiercin, Clément Allain, Adrien Lebreton, Yannick Le Cozler

Automated body condition scores at dry-off and during early lactation and milk yield of Holstein cows 1226
Pablo Pinedo, Diego Manriquez, Joaquin Azocar, Albert De Vries

Comparison of Machine Learning Algorithms to predict body weight and linear scores of beef calves with 3D imaging 1232
Terence Dechaux, Adrien Lebreton, Yannis DO, Mohammed Eljabri, Bruyas Maxence, Laurent Delattre, Corentine Gillé-Perrier, Clément Allain

3D image preprocessing and feature extraction techniques applied to cattle body traits estimation 1242
Yannis DO, Clément Allain, Terence Dechaux, Mohammed Eljabri, Laurent Delattre, Bruyas Maxence, Corentine Gillé-Perrier, Adrien Lebreton

An end-to-end method for predicting the respiratory rate of dairy cows from RGB videos 1250
Meiqing Wang, Sumin Li, Rong Peng, Susanna Räisänen, Aira Maye Serviento, Xiaoge Sun, Kai Wang, Fisher Yu, Mutian Niu

SESSION 32 - COWS WELFARE & BEHAVIOUR

Milking data and lameness: is there a relationship? 1260
Sara Mondini, Maddalena Zucali, Alberto Tamburini, Nicola Maria Palladini, Stefano Cossa, Anna Sandrucci

Keeping an Eye on Locomotion and Behavior using Computer Vision 1268
Marjaneh Taghavi, Wijbrand ouweltjes, Bert Klandermans, Claudia Kamphuis

Machine vision technology for automatic behaviour assessment of young bulls in pens 1276
Agathe Cheype, Jerome Manceau, Vincent Gauthier, Claire Dugue, Laure-Anne Merle, Quentin Delahaye, Xavier Boivin, Claire Littlejohn

Unlocking the secrets of gait: how kinematics can be used to quantify gait attributes and improve gait scores prediction in dairy cows? 1281
Célia Julliot, [Gabriel Dallago](#), Amir Nejati, Abdoulaye Diallo, Elsa Vasseur

Non-Invasive Monitoring of Vital Signs in Calves Using Thermal Imaging 1289
[Ehsan sadegh](#), Zinan Guo, Alessandro Chiumento, Paul Havinga

SESSION 33 - PIGS PARTURITION AND RESILIENCE

Sensor Fusion for Predicting Impaired Resilience in Pigs: Towards an Early Warning System 1298
[Mahsa Mohseni](#), Rudi de-Mol, Bennie van der Fels, Annemarie Rebel, Ingrid de Jong

The EnergyTag: A Wearable Software Sensor for Online Monitoring of Animal's Dynamic Energy Expenditure 1307
[Jan Aarts](#), Kristina Vodomezova, Yajing Tang, Marcel Heetkamp, Bjorge Laurensen, Ali Youssef

A Wearable Software Sensor for Parturition Onset Prediction in Sows 1315
[Chiara Lipori](#), Bjorge Laurensen, Inonge Reimert, Nicoline Soede, Ali Youssef

Exploring the Potential of Symbolic Regression in Precision Livestock Farming 1324
[Elisabeth Mayrhuber](#), Maciej Oczak, Michael Iwersen, David Brunner, Viktoria Dorfer, Stephan Winkler

Heating Strategies in Farrowing Compartments: Exploring Configurational Options and the Feasibility of Solar System Integration 1332
[Oi In Put](#), Manon Everaert, Steven Lecompte, Jarissa Maselyne

SESSION 34 - COMPUTER VISION DETECTION & ESTIMATION

PICtag: A Practical Approach to Automated Visual Identification of Livestock Animals 1342
[Eric Psota](#), Robert Fitzgerald, Justin Holl

Automated pose estimation for gait analysis in broilers – challenges and insights 1350
[István Fodor](#), Marc Jacobs, Malou van der Sluis, Britt de Klerk, Aniek C. Bouwman, Esther D. Ellen

PigDetect: a diverse and challenging benchmark dataset for the detection of pigs in images 1358
[Jonathan Henrich](#), Christian Post, Thomas Kneib, Ramin Yahyapour, Imke Traulsen

AI-based analysis of video images from farrowing pens - comparison of state-of-the-art object detection methods in the context of heterogeneous pen structures 1366
[Steffen Küster](#), Martin Wutke, Johann Warmhoff, Joachim Krieter, Imke Traulsen

Tag 'n' Track: Facilitating the Validation of Recent Animal Behaviour Monitoring Tools with Automated Annotation 1374
[Serge ALINDEKON](#), Jana Deutsch, T.B. Bas Rodenburg, Jan Langbein, Birger Puppe, Helen Louton

SESSION 35 - PLF & EMISSIONS 2

Validation of the methane production measurement accuracy and ranking capacity of portable accumulation chambers for use with small ruminants 1384

Cécile Levrault, Gareth Difford, Geir Steinheim, Peter Groot-Koerkamp, Nico Ogink

Adoption of open source software on gas emission and digital twin design of live-stock housing 1392

Kai Liu, Yulin Wang, Wei Liang, Hao Li ², Zhengxiang Shi

Real time electrochemical ammonia (NH₃) sensors performance in a natural ventilation dairy cattle barn 1400

Eduardo Rosa, Laura Rincón, Pilar Merino

How spatial autocorrelation and network analysis can support manure management: a regional approach 1406

Raffaele Grieco, Marco Bovo, Elena Cervelli, Ester Scotto di Pertea, Patrizia Tassinari, Daniele Torreggiani, Stefania Pindoizzi

SESSION 36 - COWS PRODUCTION & ENVIRONMENT

Evaluating the use of precision livestock farming tools for heat stress mitigation on dairy cattle rearing farms 1416

Xabier Díaz de Otálora, Daniel Alexander Mendez, Diego Sainz de Mena, Alberto Badías, Arantxa Villagrà, Patricia Carulla, Nawel Hlel, Fernando Estellés

Predicting Equivalent Temperature Index in Dairy Cows with the NeuralProphet Model 1421

Carlos Perez-Garcia, Stefano Benni, Patrizia Tassinari, Daniele Torreggiani, Marco Bovo

Assessment of the future productivity level of dairy cows: between dream and reality 1429

Marco Bovo, Laura Ozella, Claudio Forte, Edoardo Fiorilla, Patrizia Tassinari, Daniele Torreggiani

Detecting Cow Anomalies with Precision Dairy Farming techniques: Application to some Case Studies in the Po Valley 1437

Mattia Ceccarelli, Marco Bovo, Stefano Benni, Alberto Barbaresi, Daniele Torreggiani, Patrizia Tassinari

Seasonal and regional influence on behavioral patterns and physiological variables of dairy cows in Brazil: a time series analysis approach 1445

Tadeu Da Silva, Joao Costa

SESSION 37 - GRAZING COWS 2

The effect of milking permission and concentrate supplementation on improving milking frequency in an automatic milking system 1452

Pablo Silva, Roberta Matera, Bernadette O'Brien

Unmanned aerial systems for monitoring seasonal dynamics of sward height under rotational grazing conditions 1459

Essomandan Urbain Kokah, Cédric Geerts, Jean-François Bastin, Jerome Bindelle

| | |
|--|-------------|
| System performance on commercial pasture based automatic milking farms | 1467 |
| <u>Bernadette O'Brien</u> , Roberta Matera, Pablo Silva Bolona | |
| Evaluating the impacts of grass management technologies on the environmental and economic sustainability of Irish pasture-based dairy farms | 1474 |
| <u>Paula Palma Molina</u> , Laurence Shalloo, Thia Hennessy, Emma Dillon, Stephen Onakuse | |
| Development of an automated land-based system for cow monitoring | 1480 |
| <u>Marco Bovo</u> , Gianluca Palli, Daniele Torreggiani, Patrizia Tassinari | |

SESSION 38 - PLF & GENETICS

| | |
|--|-------------|
| Approaches to defining genetic traits from sensor data and estimation of genetic parameters | 1488 |
| <u>Katharina Schodl</u> , Birgit Fuerst-Waltl, Franz Steininger, Hermann Schwarzenbacher, Christa Egger-Danner | |
| An AI-based phenotype for dairy cattle heat tolerance | 1496 |
| <u>Anna Chlingaryan</u> , Peter Thomson, Sergio Garcia, Cameron Clark | |
| Opportunities for precision livestock farming applications in cage-free rabbit farming | 1505 |
| <u>María Cambra-López</u> , Adrián Ramón-Moragues, Enrique Blas, Pablo Marín-García, Juan José Pascual | |
| CT: a tool for improvement of pig production and health through genetic selection | 1513 |
| <u>Øyvind Nordbø</u> , Eli Grindflek | |
| European Network on Livestock Phenomics (EU-LI-PHE): an international initiative to boost high throughput phenotyping for applications in precision livestock farming and animal breeding | 1519 |
| <u>Luca Fontanesi</u> , Tomas Norton, Andreia Amaral, Adna Ašić, Laura Boyle, Geena Cartick, Emily Clark, Ivona Djurkin Kusec, Noelia Ibañez-Escriche, Despoina Karatosidi, Claudia Kasper, David MacHugh, Jarissa Maselyne, Hélène Soyeurt, Michael Toscano, Livia Vidu, Elma Zanaj | |

SESSION 39 - SENSORS & NEW TECHNOLOGIES

| | |
|---|-------------|
| The energy supply of a Multi-Sensor on dairy cattle using Energy Harvesting | 1526 |
| <u>Susanne Demba</u> , Annett Baudisch, Christopher Miersch, Danilo Zimmermann, arah Jahn, Doreen Nitsche, Steffen Pache, Kirsten Kouwert, <u>Sandra Rose</u> | |
| Autonomous smart collars for future batteryless precision livestock farming | 1534 |
| <u>David Blažević</u> , Jesse Ranta, Yoshito Mizukawa, Marla Grunewald, Jasenka Dizdarević, Riitta Niiranen, Paavo Rasilo, Admela Jukan | |
| Novel animal hair-based sensing and energy harvesting technique for precision livestock farming wearables | 1542 |
| <u>David Blažević</u> , Jesse Ranta, Asif Shaikh, Yoshito Mizukawa, Johanna Virkki, Paavo Rasilo | |
| Optimizing Feed Management in Swine Production: A Technical Evaluation of a Commercial Feed-Weighing Solution | 1549 |
| <u>Felipe Picchi</u> , Brett Ramirez, Laura Greiner | |

Decoding emotional states of laying hens: A novel approach of inducing and assessing emotions of laying hens using their vocalisations 1557
Antonis Golfidis, Pralle Buddhamas Kriengwatana, Mina Mounir, Tomas Norton

SESSION 40 - SUSTAINABILITY & ECONOMICS

Control of the environmental conditions in a nursery barn through a smart heating system and renewable energy sources 1568
Stefano Benni, Carlos Perez-Garcia, Marco Bovo, Alberto Barbaresi, Francesco Tinti, Patrizia Tassinari, Daniele Torreggiani

PigLF: improving sustainability of pig production by implementing Precision Livestock Farming technologies 1576
Queralt Allueva Molina, Àngela Ramon Pérez, Fernando Estellés, Salvador Calvet Sanz, Xavier Manteca, Pol Llonch

Development of an integrated protocol for evaluating animal welfare and environmental impact of dairy cattle farms 1583
Mariana Roccaro, Sara Pennellini, Valentina Lorenzi, Federica Mattacchione, Sara Gabriele, Simone Gallese, Giorgia Liberati, Elena Ciaffaroni, Francesca Fusi, Luigi Bertocchi, Angelo Peli, Alessandra Bonoli

A technical-economic evaluation on the application of smart pedometer prototypes on dairy cow farms 1593
Marco Bonfanti, Roberta Selvaggi, Simona Porto, Gioacchino Pappalardo

Field development of an economic modelling pipeline for measuring swine sustainability 1600
Edison Magalhaes, David Rosero, Ximena Portal, Giovani Trevisan, Derald Holtkamp, L. Schulz, R. Euken, Gustavo Silva, Daniel Linhares

POSTER SESSION - COWS AND CATTLE

- Investigation the factors affecting homogeneity index of total mixed ration in dairy buffalo herds** 1610
Chiara Evangelista, Loredana Basiricò, Umberto Bernabucci
- Automated measurement of synchronisation in pair-housed dairy calves: preliminary results** 1620
Gaia Pesenti Rossi, Marco Bovo, Valeria Pellegrin, Gloria Boldrin, Sara Barbieri, Emanuela Dalla Costa, Alessandro Gastaldo, Ambra Motta, Marzia Borciani, Greta Veronica Berteselli, Elisabetta Canali
- Construction of individual tracking dataset for developing foundational models in calving sign monitoring for beef cattle** 1625
Michihiro Nakata, Sawa Oyoshi, Teppei Nakano, Tetsuji Ogawa
- Smart management to reduce the effects of extended heat stress in dairy cows on milk quality traits** 1633
Daniela Lovarelli, Giulietta Minozzi, Francesco Tiezzi, Marcella Guarino
- Innovations in Real-Time Monitoring of Cattle Face Recognition for Feeding Behaviors Utilizing Advanced Deep Learning Techniques** 1641
Namkyu Kang, Wei Liu, Suheon Kim, Hongdae Kim, Junghwan Lee
- The attended outcomes of the project INstructions from PLF Data Analysis to improve the CATtle farming (INDACAT)** 1650
Daniela Lovarelli, Gianluca Bambi, Matteo Barbari, Valentina Becciolini, Marco Bonfanti, Marco Bovo, Simona Porto, Patrizia Tassinari, Marcella Guarino
- A link between PLF, animal welfare and LCA: the objectives of SUS3D project** 1657
Marco Bovo, Chiara Capretti, Matteo Chincarini, Davide Di Battista, Claudia Giannone, Lydia Lanzoni, Enrica Santolini, Giorgio Vignola
- Use of a robotic milking system by cows of different genotypes reared in a silvopastoral system** 1665
Alexandre Rossetto Garcia, Lívia Ferreira Pinho, Teresa Cristina Alves, Luiz Francisco Zafalon, Verônica Schinaider do Amaral Pereira, Erick Fonseca de Castilho, Leonardo Nanni Costa, Giovanna Galhardo Ramos, Gabriela Novais Azevedo, Leticia Krugner Zanetti, Christine Elisabeth Grudzinski, Mariana Jucá Moraes
- Precision Livestock Farming: Bridging the Gap Between Media Narratives and Scientific Realities in Climate Change Impact** 1673
Martina Lamanna, Giovanni Buonaiuto, Francesco Dalla Favera, Alberto Romanzin, Andrea Formigoni, Damiano Cavallini
- Mapping of air temperature and relative humidity in Compost-Bedded Pack Barn systems using a network of easily obtainable recording sensors** 1681
Carlos Oliveira, Ilda Tinôco, Victor Oliveira, Rafaella Andrade, Matteo Barbari

POSTER SESSION - PIGS

- The effects of smart farm implementation on sow productivity** 1690
Byeonghyeon Kim, Kyeongseok Kwon, Dong-Hwa Jang, Vandet Pann, Jong-Bok Kim
- A Two-Stage Computer Vision Framework for Individual Recognition and Precision Data Collection Illustrated through Piglets in Farrowing Pens** 1698
Guo Chuanyi¹, Zhaojin Guo, Thomas Ede, Li Lyu, Zheng He, Axiu Mao, Thomas D. Parsons, Kai Liu
- Construction of Small-Scale Smart Pig Engineering Experimental & Demonstration Facility for Integrated Management of Carbon Emissions in Livestock Facilities** 1707
SUNHYOUNG LEE, RACKWOO KIM, SUBEEN AHN, SEUNGHUN LEE, CHANMIN KIM, HEEWOONG SEOK, HAN KIM
- A computer vision-based approach for the behavioral classification of sows and piglets in the farrowing crate** 1714
Pieter-Jan De Temmerman, Laura Ingelbrecht, Beele Garré, Marijke Aluwé, Dominiek Maes, Jarissa Maselyne
- Effect of a *Bacillus* spp. cocktail combined with a potato-derived substrate on performance and faecal parameters of post-weaned piglets** 1722
Sandrine Dufourny, Mario Aguedo, Othmane Benchaib, Giulia De Razza, Thami El Mejdoub, Sébastien Gofflot, Serge Hilgsmann, Julien Populin, Martine Schroyen, Philippe Thonart, José Wavreille
- Air quality monitoring in piggeries through an IoT gas and environmental sensors device** 1728
Alberto Finzi, Antonio Mautone
- Optimal sampling interval to study proximity networks in pigs based on computer vision** 1737
Clémence A.E.M. Orsini, Bernadett Hegedűs, Lisette E. van der Zande, Inonge Reimert, Piter Bijma, J. Elizabeth Bolhuis

POSTER SESSION - POULTRY

- Sustainability assessment of egg production as affected by genotype and rearing system** 1746
Federica Volpe, Enrica Santolini, Marco Zampiga, Marco Bovo, Daniele Torreggiani, Patrizia Tassinari, Massimiliano Petracchi, Federico Sirri
- Economic effect of implementing e-nose biosensors in poultry production for early disease detection** 1754
Jonathan Munoz Perez, Henk Hogeveen, Mariska van-der-Voort, Frans Verhees
- Effect of exogenous melatonin on body temperature of slow-growing chickens, measured by injectable transponders** 1761
Carlos Palacios riocerezo, Jose Alfonso Abecia, Javier Plaza, Jaime Nieto
- Assessing the Feasibility of Drone-Assisted Pasture Rotation for Small-Flock Poultry Management: Preliminary Findings** 1767
Pramir Maharjan, Jason de Koff, Biswajit Kumar Biswas

| | |
|---|-------------|
| Detection of chicken breast muscles affected by Wooden Breast abnormality by Nuclear Magnetic Resonance and dielectric spectroscopy | 1772 |
| <u>Massimiliano Petracci</u> , Francesca Soglia, Eleonora Iaccheri, Martina Bordini, Luca Laghi, Luigi Ragni | |
| Development of regression model for energy loads prediction of broiler houses in South Korea using building energy simulation | 1780 |
| <u>Kyeongseok Kwon</u> , Jong-Bok Kim, Byeonghyeon Kim, Dong-Hwa Jang, Vandet Pann | |
| Assessment of odour diffusion and health risks from intensive laying hen farms under different topographic and meteorological parameters | 1788 |
| <u>Yu 刘</u> , Ligen Yu, Qifeng Li, Guanghui Teng, Chaoyuan Wang | |
| SalmonellaDetector: A Mobile Application for On-site Broiler Salmonella Infection Diagnosis | 1796 |
| Venkat U. C. Bodempudi, Guoming Li, Adelumola Oladeinde, <u>Samuel Aggrey</u> | |
| Behavioural recognition model for laying hens based on skeletal feature points | 1803 |
| Peng Yin, Siqi Wei, <u>Qin Tong</u> , Baoming Li, Chen Yujia, Yang Wang | |

POSTER SESSION - OTHER ANIMALS

| | |
|--|-------------|
| Camera trap data to estimate wildlife census and habitat use: preliminary results in the Dynamo Oasis (Pistoia, Italy) | 1814 |
| <u>Leonardo Conti</u> , Rafael Pinheiro Amantea, Giulia Santalmasi, Matteo Bianchi, Giovanni Miotti, Caterina Sottili | |
| IoT gas and environmental sensors to monitor air quality in goat farms in Northern Italy to improve animal welfare and environmental sustainability | 1824 |
| <u>Stefania Celozzi</u> , Silvana Mattiello, Alberto Finzi | |
| Can accelerometer devices be a reliable tool for measuring horse lying behavior? A pilot study | 1832 |
| <u>Emanuela Dalla Costa</u> , Elie Atallah, Michela Minero, Silvia Mazzola, Marco Bovo | |

Presenting authors are underlined in the authors' lists