

## First Asian Conference on Precision Livestock Farming (PLF-Asia 2016) held in Beijing, China

Zheng Weichao<sup>1</sup>, Wang Chaoyuan<sup>1</sup>, Liu Wen<sup>2</sup>, Li Baoming<sup>1</sup>, Hongwei Xin<sup>3</sup>

(1. Key Laboratory of Agricultural Engineering in Structure and Environment, MOA, China Agricultural University, Beijing 100083, China

2. Chongqing Academy of Animal Sciences, Chongqing 402460, China

3. Departments of Agricultural & Biosystems Engineering, Iowa State University, Ames, Iowa 50011, USA)

The 1<sup>st</sup> Asian Conference on Precision Livestock Farming (PLF-Asia 2016), jointly sponsored by China Agricultural University (CAU), the International Research Center for Animal Environment and Welfare (IRCAEW) and the Chinese Society of Agricultural Engineering, was convened at CAU International Conference Center, Beijing, China on September 9-11, 2016. Prof. Li Baoming from CAU and Prof. Hongwei Xin from Iowa State University co-chaired PLF-Asia 2016. Prof. Liu Zuohua from Chongqing Academy of Animal Sciences (CAAS) was the Organizing Committee Chair. Prof. Gong Yuanshi, Vice President of CAU gave a welcome and opening speech. Prof. Wang Maohua, an Academician of Chinese Academy of Engineering shared his thoughts on precision livestock farming in the opening remarks.

Precision Livestock Farming (PLF) aims to achieve smart animal farming by using real-time sensing, data analysis, information technology, and decision-making to improve animal health, welfare and production efficiency. PLF-Asia 2016 aimed to address issues facing the global animal production industry by bringing together some of the best minds and future professionals on PLF from around the world to share the latest research, technological advancements, farm level application, and future visions in this field. Over 190 agricultural engineers, animal scientists, veterinarians, industry leaders as well as the pre-professionals from seven countries joined together to exchange the latest findings and discuss the past experiences, current state and future development on precision livestock farming. During the conference, 33 oral presentations were given on the topics across precision livestock farming, including:

- ✧ Sound monitoring technology and application
- ✧ Behavior monitoring technology and application
- ✧ Environmental control and monitoring
- ✧ Internet of things

✧ Software development and sensors

The keynote speech given by Mr. Wang Junxun, Deputy Director of Department of Livestock Production, China Ministry of Agriculture (MOA), presented the challenges, opportunities and measures in the transformation of animal production industry in China. Prof. Daniel Berckmans from Catholic University of Leuven, Belgium, shared latest research experience with PLF on European farms in his keynote speech. Prof. Xiong Benhai, from Institute of Animal Science of Chinese Academy of Agricultural Sciences, China, reviewed the research advances in the dynamic nutrient requirements and precision livestock farming.

Eight presentations were delivered in the general session of the conference, and laid out the most currently research findings on PLF. Prof. Hongwei Xin from Iowa State University presented an automated monitoring system for characterization of individual hen feeding and nesting behaviors in enriched colony housing. The results will enhance the development or improvement of guidelines for the hen-housing system design and management. A new mode of smart agriculture was introduced by Ms. Yu Ying from Beijing Nongxin Internet Technology Co., Ltd, China. Prof. Guoqing Zhang from Aarhus University in Denmark reviewed models defining effective temperature for different farm animals. A fundamental principle underlying the development of an integrated indoor climate sensor to reflect animal thermal well-being was also presented by Prof. Zhang. Prof. Lingying Zhao from The Ohio State University in USA introduced development of embedded systems and advanced sensor networks for precision monitoring of indoor environment in animal buildings. Prof. Daniel Berckmans from Catholic University of Leuven shared the design of a farm prototype for automated detection of lame dairy cows. Farmers have started implementing the information from the warning

system using the design in their daily lameness management. Precision application of the information construction based on SAP for layer breeding hens was reported by Ms. Liu Aiqiao from Yukou Poultry, China. Dr. Jiqin Ni from Purdue University in USA shared his experience on how to use low-cost passive infrared detectors to monitor pig activities in a research facility. Dr. Richard Gates from University of Illinois at Urbana-Champaign in USA showed image analysis as a method for assessing broiler chicken's feeding behavior, which yielded a lower percentage error compared to data obtained by the visual method.

A total of 22 oral presentations by global researchers covered considerable new precision farming technologies and methods developed for monitoring the thermal environments, growth and production, behaviors and health status for poultry, pigs and cattle. In addition, some research activities and progress on information techniques including platform, precision control and technology innovations in animal production processes were shared. Along with the oral presentations to support the central

theme of the conference are 36 quality contributing papers and extended abstracts from global researchers.

With the promulgation and implementation of "Health China 2030 program", the safety of animal products is attracting more and more attention. Healthy livestock farming cannot be accomplished without the precision intelligent control on feed nutrition and housing environment, precision monitoring and data feedback on the related parameters during production, as well as precision management. Seven biennial European conferences on PLF (EU-PLF) have been continuously held in Europe. As livestock farming transformation intensifies in China, holding the 1<sup>st</sup> PLF-Asia (PLF-Asia 2016) in Beijing is expected to be beneficial to the development, both technically and strategically, long and short term. Led by IRCAEW ([www.ircaew.org/](http://www.ircaew.org/)), the conference was jointly hosted by the Key Laboratory of Agricultural Engineering in Structure and Environment, MOA; Chongqing Academy of Animal Sciences; and Zhejiang University.

(Edited by Dr. Wang Yingkuan)



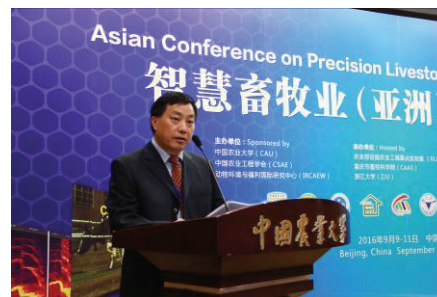
Group photo of PLF-Asia 2016 participants



Prof. Wang Maohua addressed opening remarks



Prof. Daniel Berckmans gave keynote speech



Prof. Li Baoming gave conference summary