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## Description and consequences of variability in sows and piglets

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# Book of Abstracts of the 69<sup>th</sup> Annual Meeting of the European Federation of Animal Science



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**Genetic bases of individual performance variation in pigs***L. Bodin<sup>1</sup>, N. Formoso-Rafferty<sup>2</sup> and H. Gilbert<sup>1</sup>**<sup>1</sup>INRA, GenPhySE, 31326 Castanet-Tolosan, France, <sup>2</sup>Universidad Complutense de Madrid, Fac. de Veterinaria, Dept. of Animal Production, Madrid, Spain; loys.bodin@inra.fr*

Part of the variability of performances in animal production is due to the genetic variation in the level of a trait between animals; that is the keystone of all genetic improvement programs and has to be maintained to guarantee the long-term sustainability of the selection progress. Another part of the performance variability comes from the individual variation of responses to various environmental conditions, called environmental sensitivity, which can have a highly negative impact on the final profitability of the production. Joint estimations of breeding values (EBV) and genetic parameters of the individual environmental sensitivity of a trait can be obtained along with those of the level of the trait. Moreover, use of these two kinds of EBV in genetic programs partly depends on their correlations as well as their genetic relationships with other traits. In pigs, homogeneity of litter size is desired and in many cases its mean level should not decrease. Similar relationships between objectives exist for the birth weight components (mean and variability); homogeneity is desired to ensure good perinatal viability and subsequent growth, but the mean birth weight should also not decrease. The genetic parameters and relationships between components (mean and variability) of birth weight and litter size in pigs will be presented along with similar parameters estimated in a mice experiment. Furthermore, similar estimations were obtained for production traits, such as residual feed intake and growth, which will be discussed in the perspective of producing more efficient and robust animals.

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**Session 29****Theatre 2****Description and consequences of variability in sows and piglets***N. Quiniou<sup>1</sup>, M. Marcon<sup>1</sup>, Y. Salaün<sup>1</sup>, J.Y. Dourmaud<sup>2</sup>, F. Gondret<sup>2</sup>, H. Quesnel<sup>2</sup>, J. Van Milgen<sup>2</sup> and L. Brossard<sup>2</sup>**<sup>1</sup>IFIP-Institut du Porc, BP 35, 35650 Le Rheu, France, <sup>2</sup>PEGASE, INRA, Agrocampus-Ouest, 35042 Rennes, France; nathalie.quiniou@ifip.asso.fr*

Even though animals are from the same genetic line, farmers have to cope with variability both in sows and piglets. In sows, variability is observed in traits such as parity, prolificacy, appetite, body weight (BW) and back fat thickness (BF). For instance, at the beginning of gestation, variability in body condition among sows can be high due to parity and age. In addition, at a given age, variability in litter size, milk potential, and appetite results in different nutrient requirements and consequently in variability of changes in maternal body reserves. Variability in BF can be a problem as several studies have indicated that too high or too low BF values are to be avoided at farrowing as well as at weaning. In both cases, the longevity of the sow is impaired, and farmers are advised to manage the sows toward a target BF depending on the physiological stage, associated with an age-dependant BW, increasing with age up to mature BW. In addition, variation in sow's body condition at farrowing and in prolificacy influences the new born and weaning piglet traits. Compared to less prolific sows, high-prolific sows farrow more piglets, which are both lighter on average and more heterogeneous. Compared to normal birthweight piglets, the survival rate of low birthweight piglets is lower. Providing additional care around birth helps these piglets to survive, but subsequent housing and feeding management have to be adapted to deal with the variability in their growth potential. Nutritional strategies (based on modelling approaches that take into account criteria that influence requirements) are suggested to optimise the expression of the animals' potential, but most often without an intention to reduce inter-individual variability in growth performance. In order to control or reduce variability, other solutions have been evaluated in experimental studies that focus on the level and the dynamic of the feeding plan and the quality of the diet. The challenge is now to validate these solutions in production units, which will be more or less easy depending on the existing housing and feeding systems, and the economic, welfare and environmental context.