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David Renaudeau, Jean-Luc Gourdine, Mélynda Hassouna, Paul Robin, Hélène Gilbert, Juliette Riquet, Jean-Yves Dourmad

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86. « PigChange »: a project to evaluate the consequences of climate change and mitigation options in pig production

Renaudeau David¹, Gourdine Jean Luc², Hassouna Melynda³, Robin Paul³, Gilbert H el ene⁴, Riquet Juliette⁴, Dourmad Jean Yves¹

¹INRA, UMR 1348 PEGASE, F35590 St-Gille, France

²INRA, UR 143 URZ, F97170 Petit Bourg, France

³INRA, UMR 1069 SAS, F35000 Rennes, France

⁴INRA, UMR 1388 GenPhySE, F31326 Toulouse, France

Climate change, as suggested by many global climatic models, will impact the economy of livestock production systems worldwide. The general aim of the PigChange project is to combine regional climate projections with models predicting the effect of climate on pig performance to evaluate the degree of vulnerability of French pig industry to climate change and to propose new tools for developing innovative adaptation options for coping with thermal heat stress. The first task of the project focused on modelling approaches to evaluate the impact of climate change on the thermal environment in pig buildings and the consequences of thermal heat stress on daily feed intake and subsequent pig performance. The combination of these models with regional climate projections allowed us to evaluate the degree of vulnerability of French pig producers at different time scales (near and distant future). The second task of the project was dedicated to the evaluation of current coping options (nutrition, housing and genetic) for reducing the effects of thermal heat stress on pig farms profitability. For example, we showed that the maintenance of optimal growth or lactation performances in hot conditions could be obtained in the future by adjusting the dietary composition in attempt to compensate the negative effects of thermal environment on animal's voluntary feed intake. Breeding for heat tolerance, if successful, is a promising approach for mitigating the effect of thermal heat stress on pig performance. Using a modelling approach, we evaluated the possibility to genetically improve pig heat tolerance with conventional breeding selection methods. The last task of the project aimed to generate new insights on predictive direct or indirect biological indicators of heat tolerance. These new tools could lead to propose new coping strategies focused on individual animal management ("precision agriculture" concept) and/or to find new phenotypes for genetic and genomic selection approaches.

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