



# Dynamic modeling of nutrient use and sows' individual requirements

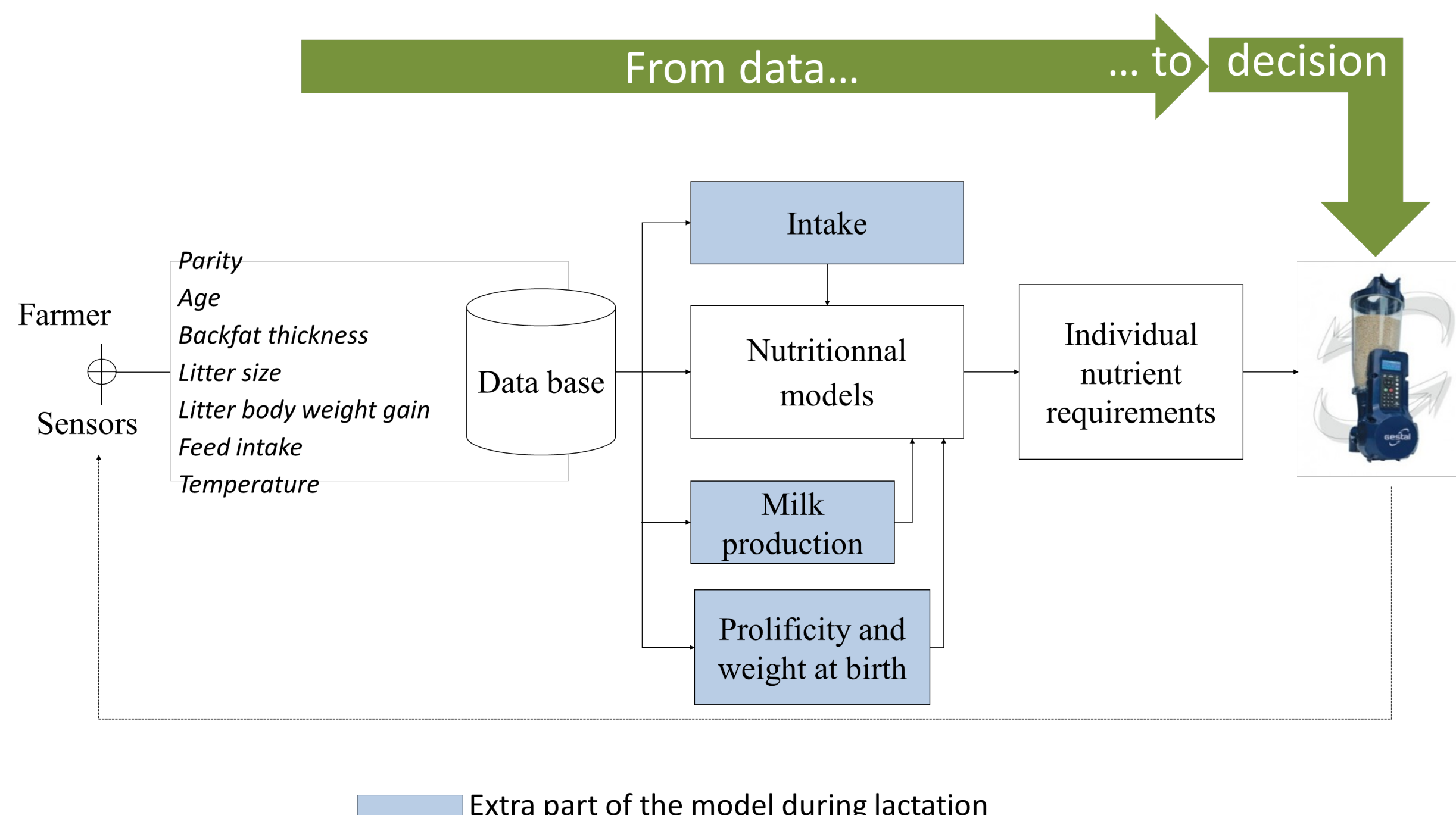
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## OBJECTIVE

- ✓ Include individual variability in the calculation of sow's nutritional requirements during gestation and lactation in order to develop a decision support system allowing an automatic precision feeding.

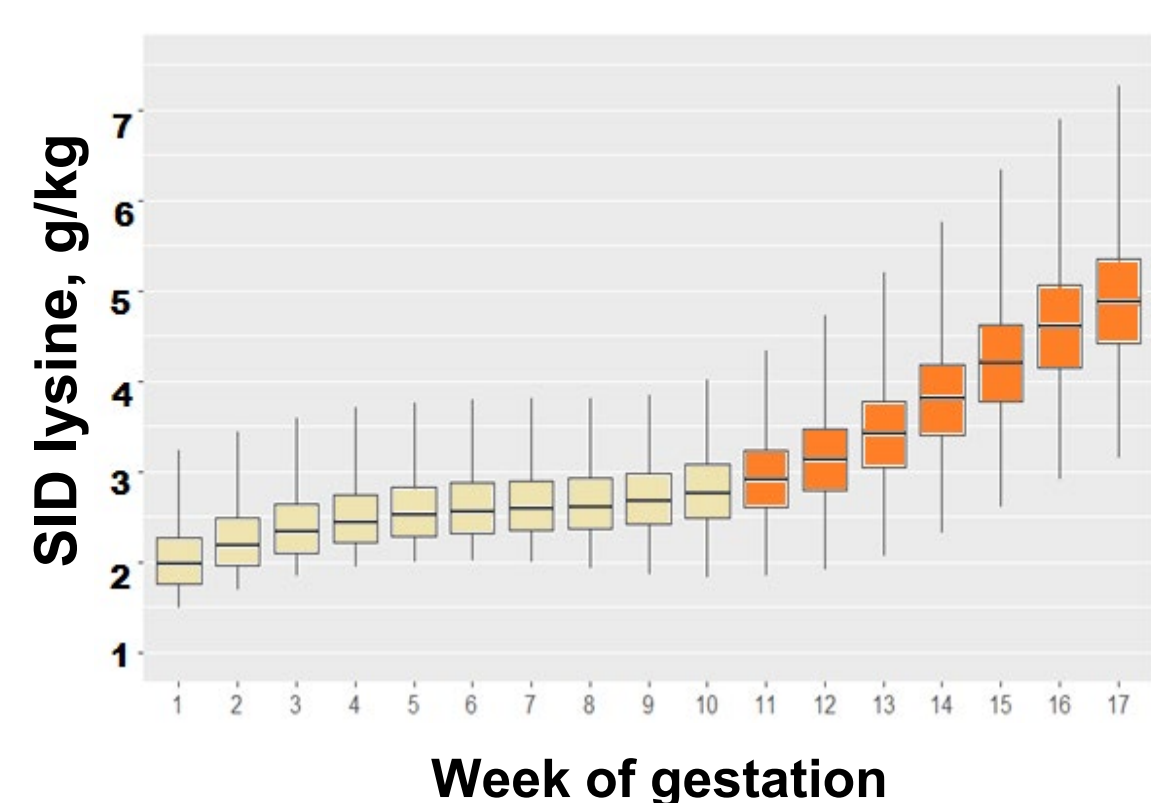
## THE DECISION SUPPORT SYSTEM



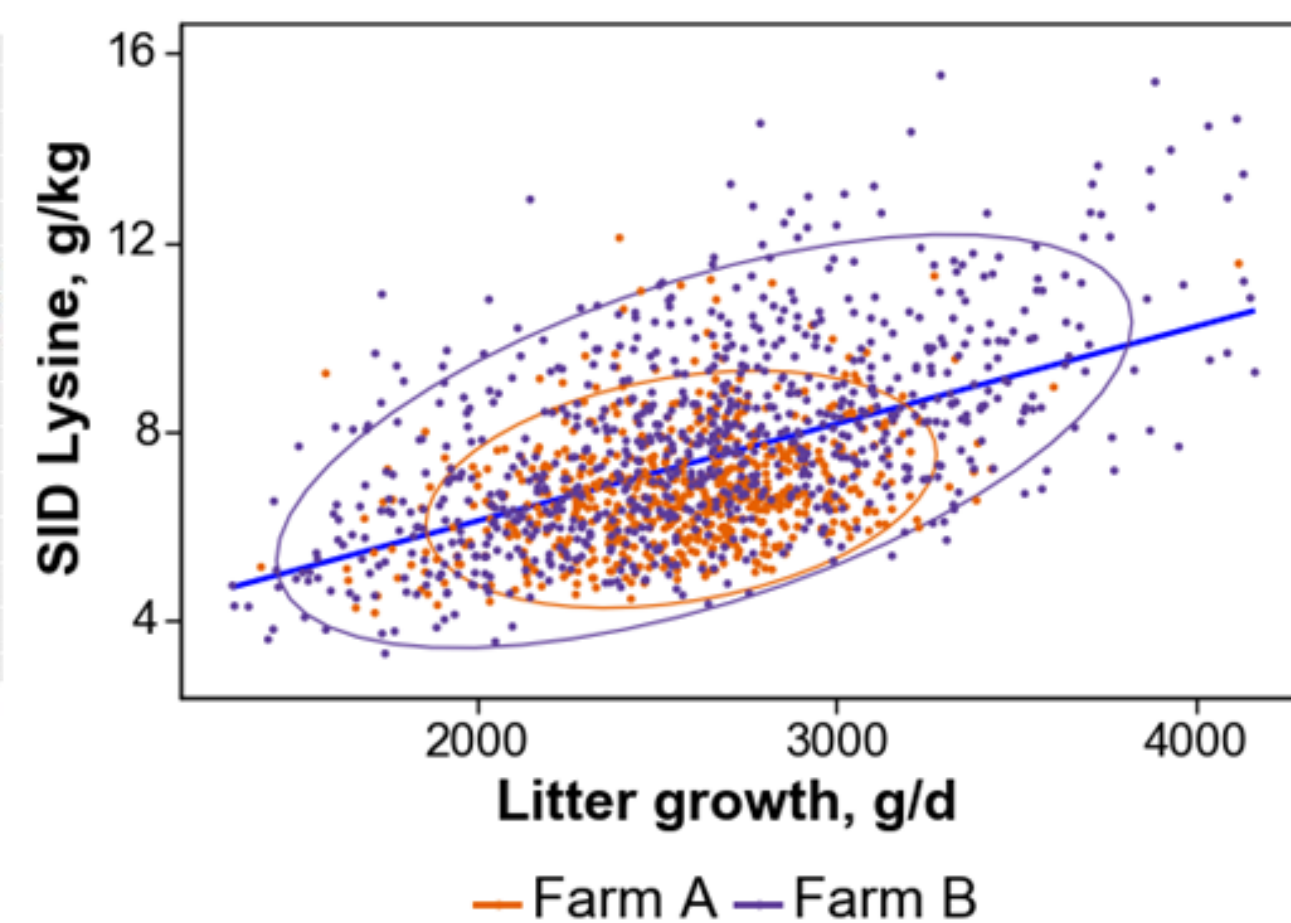
## RESULTS – Modeling the requirement

- ✓ Sow's nutritional requirements largely vary according to time (i.e. gestation) and among sows (i.e. lactation)

Variability and evolution of lysine requirement over gestation, g/ kg



Distribution of lysine requirement during lactation, g/ kg



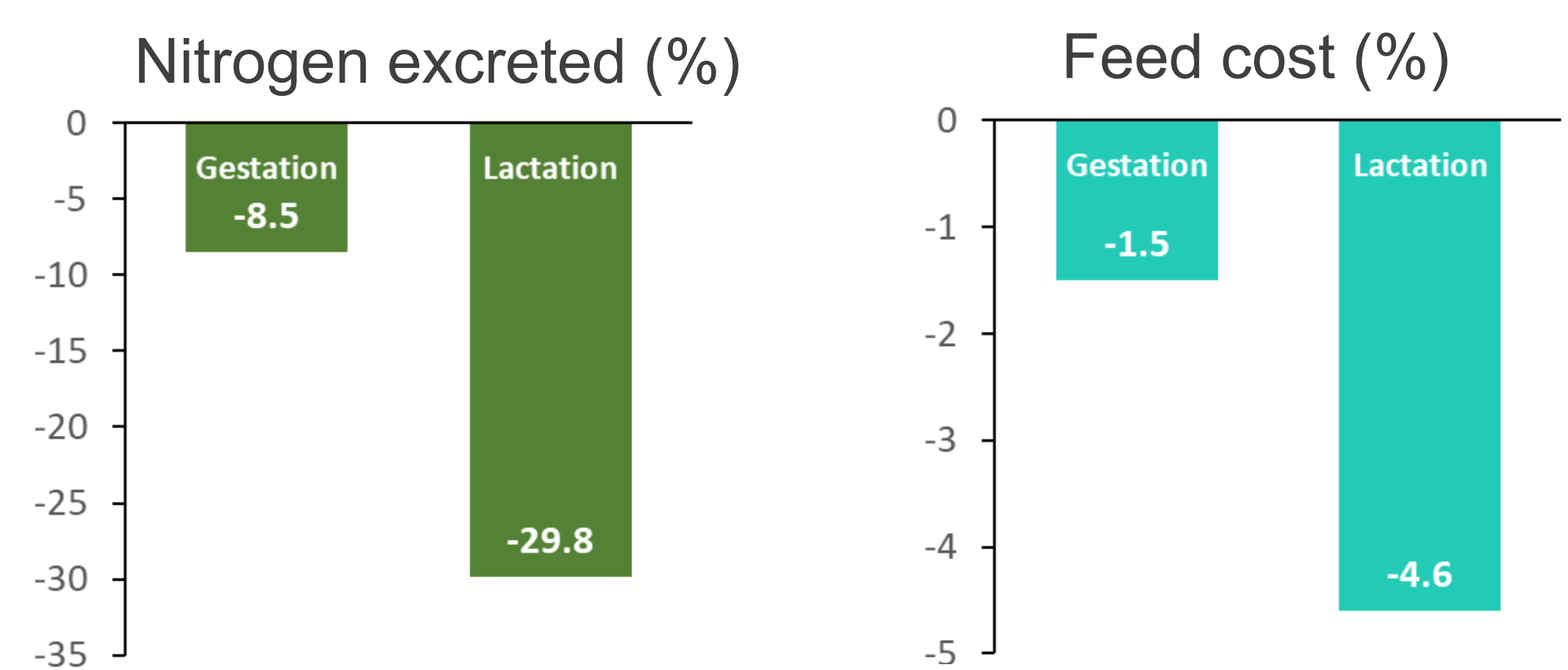
## RESULTS – Precision feeding

- ✓ Precision feeding, defined as the individual and daily mix of 2 diets with different nutritional contents (A and B), reduced lysine supply by 27% and 8% during gestation and lactation, respectively, compared to conventional feeding (1 gestation diet, 1 lactation diet for all).

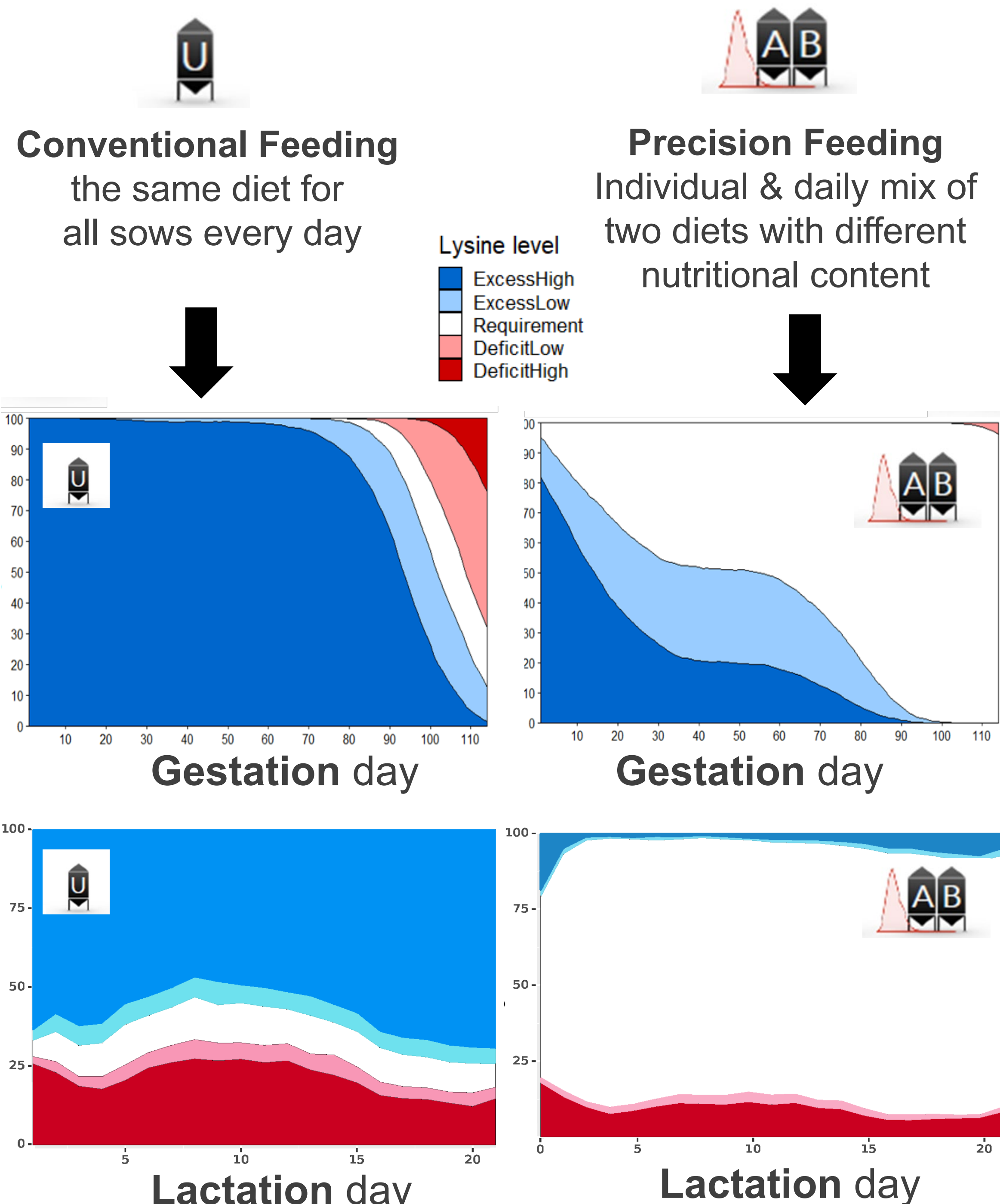


## RESULTS – Precision feeding (continued)

- ✓ Precision feeding, reduced nitrogen excretion and feed cost



- ✓ At both stages, precision feeding ensured a better coverage of sows' lysine requirements, with a higher proportion of sows adequately fed and less sows over- or under- fed



[www.feed-a-gene.eu](http://www.feed-a-gene.eu)



**Feed-a-Gene** is a European H2020 project involving 23 partners which aims to adapt feeds, animals and feeding techniques to improve the efficiency and sustainability of pig, poultry and rabbit production systems. It is coordinated by INRAE (France), started in March 2015 and will last 5 years. The project aims to reduce the environmental impact of monogastric livestock production by improving and diversifying animal diets and feed technologies and by integrating new selection criteria for these animals. The Feed-a-gene project further aims to develop new management systems for precision feeding and precision farming and to evaluate the overall sustainability of the different management solutions proposed in the project.



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