INRAPORC® A tool to analyze performance and to evaluate nutritional strategies in growing pigs and sows

INRAPORC integrates current knowledge of nutrition of growing pigs and sows in a model and software tool. The objective of the model is to evaluate different nutritional scenarios for growing pigs and sows.

The software consists of three modules: a Feed module, a Sow module, and a Growing Pig module. The Feed module allows characterizing the feed that is going to be used and includes the feed ingredients database of INRA-AFZ. Users can also import data from their own database of feed ingredients. Energy (or components of energy) and amino acids are the main components of the feed characterization. For energy, faecally digestible nutrients are used as inputs, from which DE, ME and NE values are calculated. The user may also enter a known DE, ME, or NE value in order to correct fecal digestibility values. The standardized ileal digestible amino acid content is used as an input and the availability of 12 amino acids is considered in model calculations.

The sow and growing pig modules are very similar in design. Both modules offer the possibility to perform a simulation based on a feeding strategy and potential animal performance (housing conditions are also considered for sows). The results of a simulation can be shown as a summary report or as graphs that illustrate how the animal uses nutrients for different physiological functions. The first-limiting nutrient for protein deposition or milk production can be determined, and the dynamic change in nutrient requirements can be deduced easily from the graphs. Nutrient balances (intake, retention and excretion) are calculated for different minerals including N, P, Cu and Zn.

Results from different simulations can be compared graphically or numerically (e.g., to compare performance using different feeding strategies). In addition, a sensitivity analysis can be performed in which the sensitivity of model predictions relative to key model parameters is determined.

Defining the potential performance of the pigs is the core of the model, which can be done with limited, on-farm information. The sow module may be parameterized using average data for the herd including feed intake during gestation and lactation, litter growth, backfat and weight loss during lactation. Based on this average information, model parameters are calculated for litters 1 through 8. Similarly, the potential performance for a growing pig can be realized using the average feed intake and growth during the growing and finishing periods.

INRAPORC is intended to be used by animal nutritionists or can be used to train nutritionists. For nutritionists, INRAPORC can be a helpful tool to evaluate the current feeding strategy on a farm and to propose other strategies that may be less costly or more environmentally friendly. Because of the user-friendly interface and the numerous ways in which simulation results can be displayed, INRAPORC can be useful tool in teaching nutritional principles (e.g., the difference between digestible, metabolizable and net energy can be easily demonstrated). The software is currently available in French, English, German, Dutch, Spanish and Italian versions.

INRAPORC has been developed by the INRA-Agrocampus joint research unit “Livestock Production Systems, Animal and Human Nutrition (UMR SENAH)” in Rennes, France. It can be purchased (500 € +VAT) from INRA TRANSFERT, an INRA subsidiary. For educational purposes, universities can obtain a slightly limited version of INRAPORC free of charge. For further information, please consult the InraPorc web site http://www.rennes.inra.fr/inraporc/.