

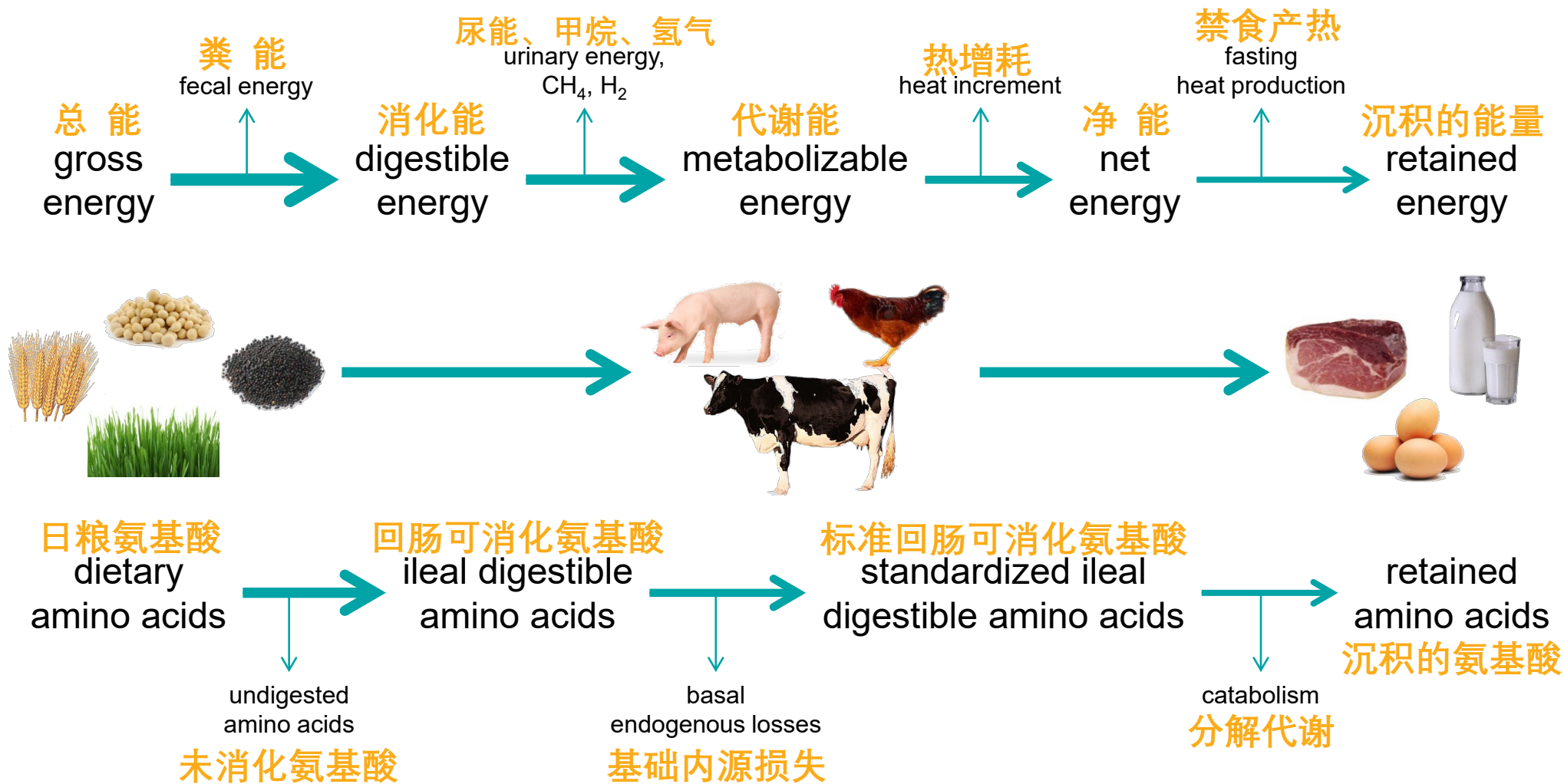


➤ InraPorc: a model and decision support tool
for the nutrition of growing pigs and sows

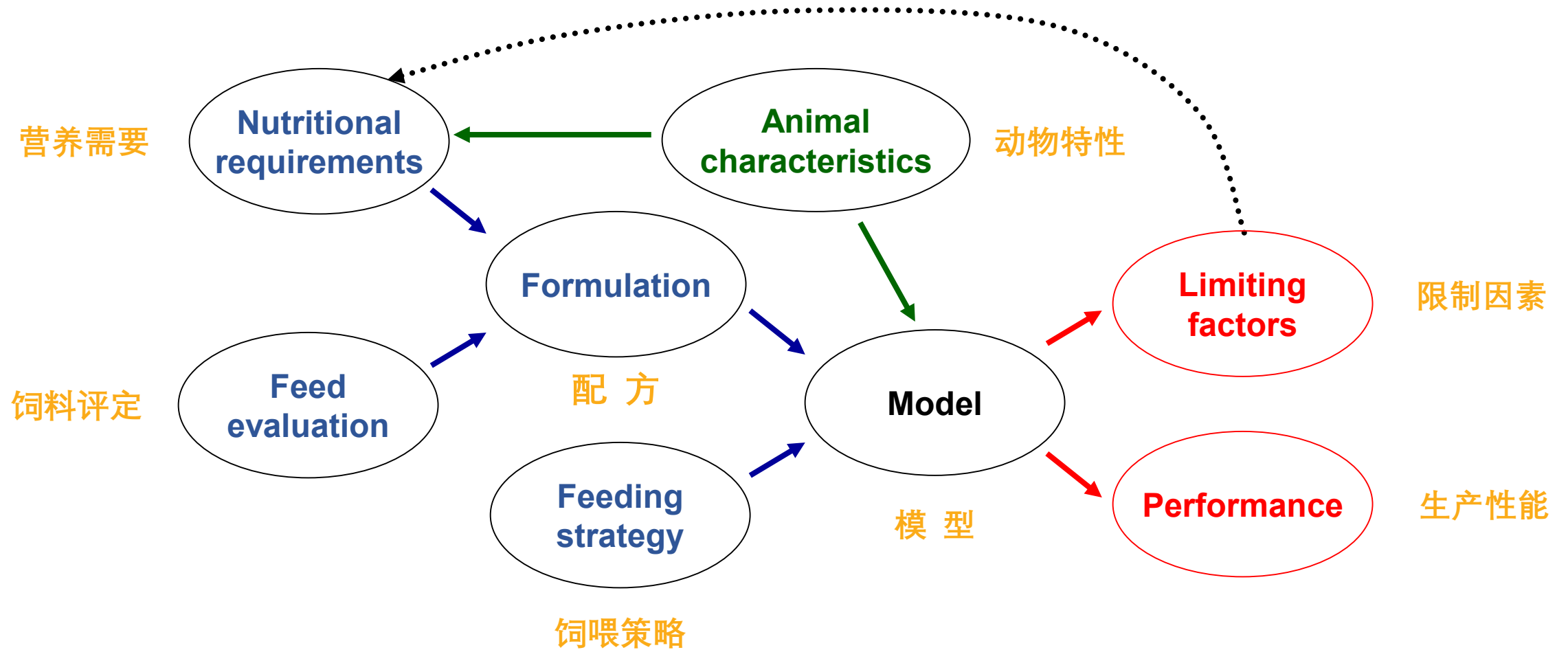
Jaap van Milgen

InraPorc: 一种用于生长猪与母猪营养的模型和决策支持工具

Nutritional systems in livestock production 畜牧生产中的营养系统



➤ The use of models in animal nutrition 模型在动物营养领域的应用



➤ Nutritional modeling of growth 生长的营养模型

Anim. Prod. 1974, 19: 221-231

MODEL RESPONSES OF THE GROWING PIG TO THE DIETARY INTAKE OF ENERGY AND PROTEIN

C. T. WHITTEMORE AND R. H. FAWCETT
*School of Agriculture, University of Edinburgh,
West Mains Road, Edinburgh EH9 3JG*

SUMMARY

A simple model is described which enables the prediction of the magnitude and direction of the responses of growing pigs to different energy and protein intakes. The model calculates daily live-weight gain from the conversion of the dietary supply of crude protein and energy into protein, lipid and ash in the body of the growing pig. Values were also determined for the energy and protein balances, the composition of the body and the efficiency of feed conversion. The model was formulated with factors drawn from published findings and validated by comparison with independent feeding trials.

(该文) 阐述了一种能够预测生长猪对不同能量与蛋白质摄入量的反应幅度及方向的简单模型。



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➤ Objectives of the InraPorc project InraPorc的项目目标

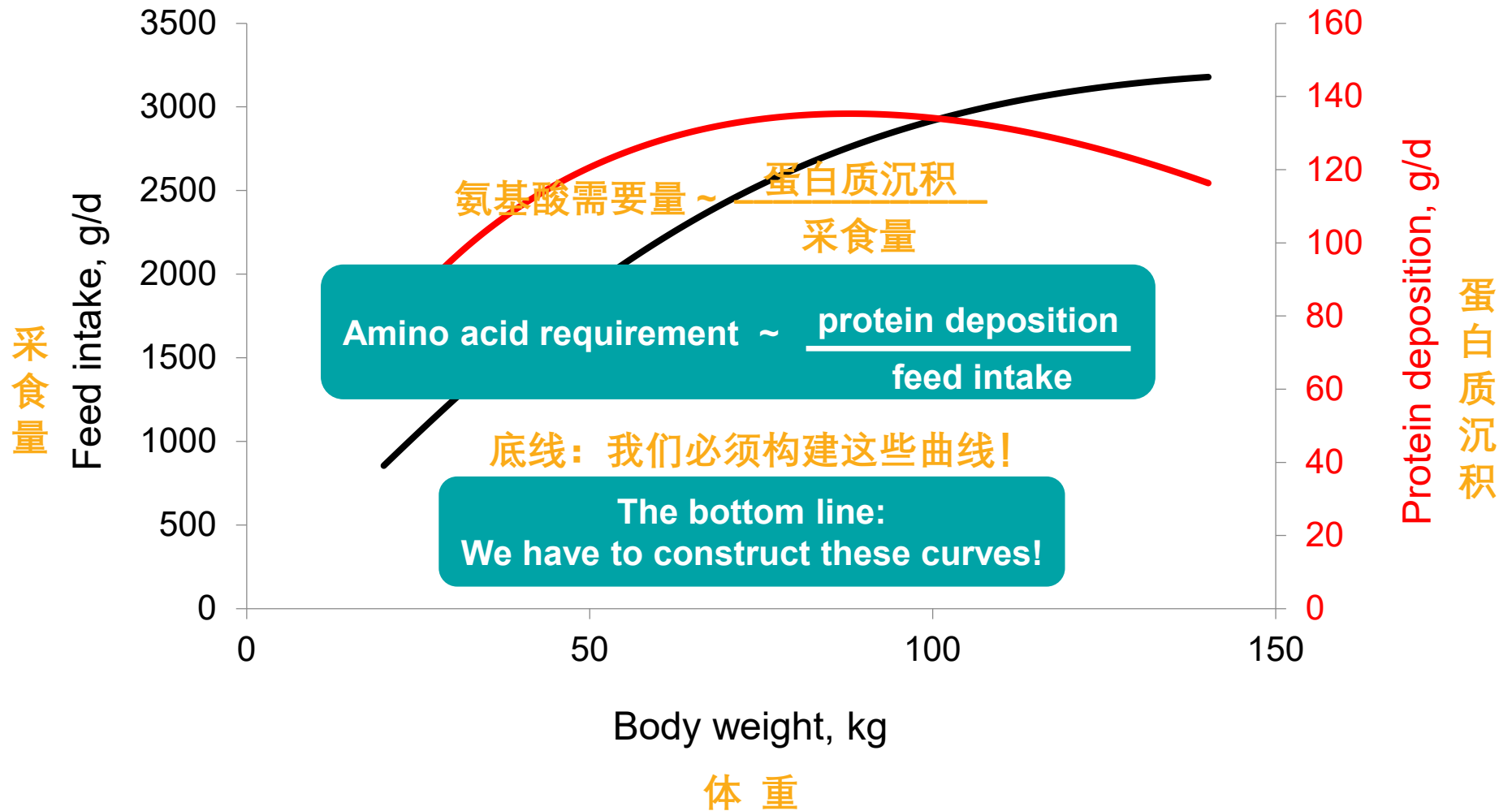
整合当前母猪和生长猪营养利用的知识

- Integrate current knowledge of nutrient utilization by sows and growing pigs:
 - Energy (DE, ME, NE) 能量（消化能、代谢能、净能）
 - Digestible amino acids (AID, SID) 可消化氨基酸（表观回肠可消化，标准回肠可消化）
 - Digestible phosphorus 可消化磷
- Predict the response of the animal to the nutrient supply: 预测动物对营养供应的反应
 - Weight gain, feed efficiency, body composition 体增重、饲料效率、体组成
 - Identify the limiting factors in the diet 识别日粮中的限制因子
- Improve the definition of nutritional requirements: 完善营养需求的定义
 - Performance objectives 生产性能目标
 - Account for dynamic changes in requirements 将营养需求中的动态变化纳入考量
- Make the model and tool accessible for the teaching of animal nutrition and for professional swine nutritionists 使该模型和工具适用于动物营养教学及猪营养专家



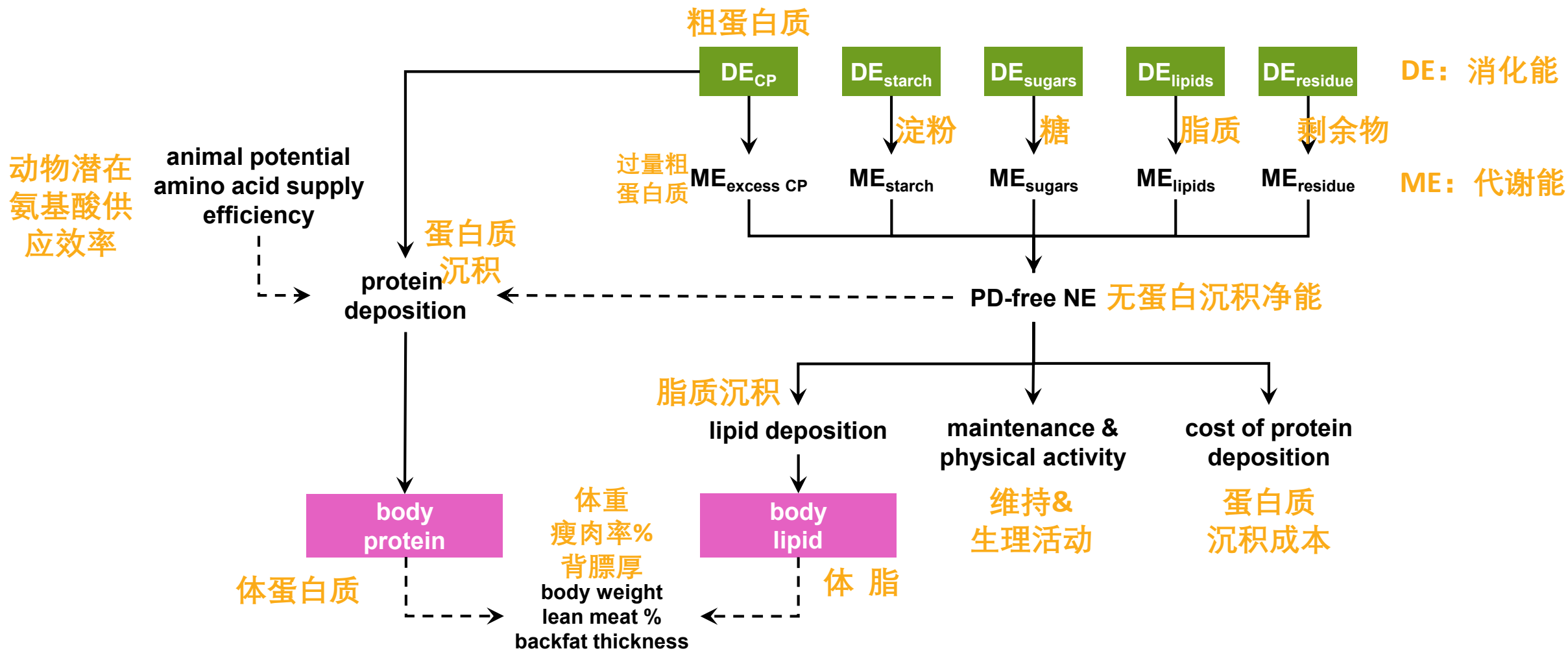
➤ Growing pigs: protein deposition and feed intake vary differently

生长猪：蛋白质沉积与采食量变化趋势不同



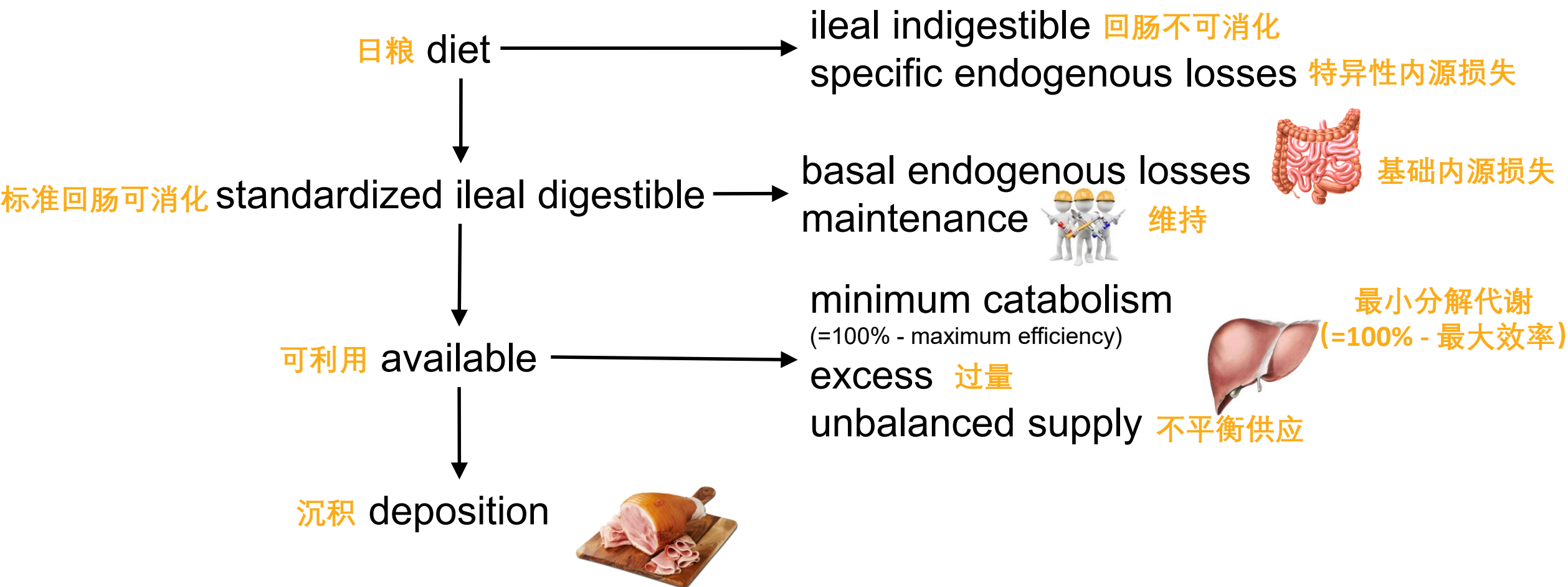
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➤ Growing pigs: partitioning of energy 生长猪：能量分配



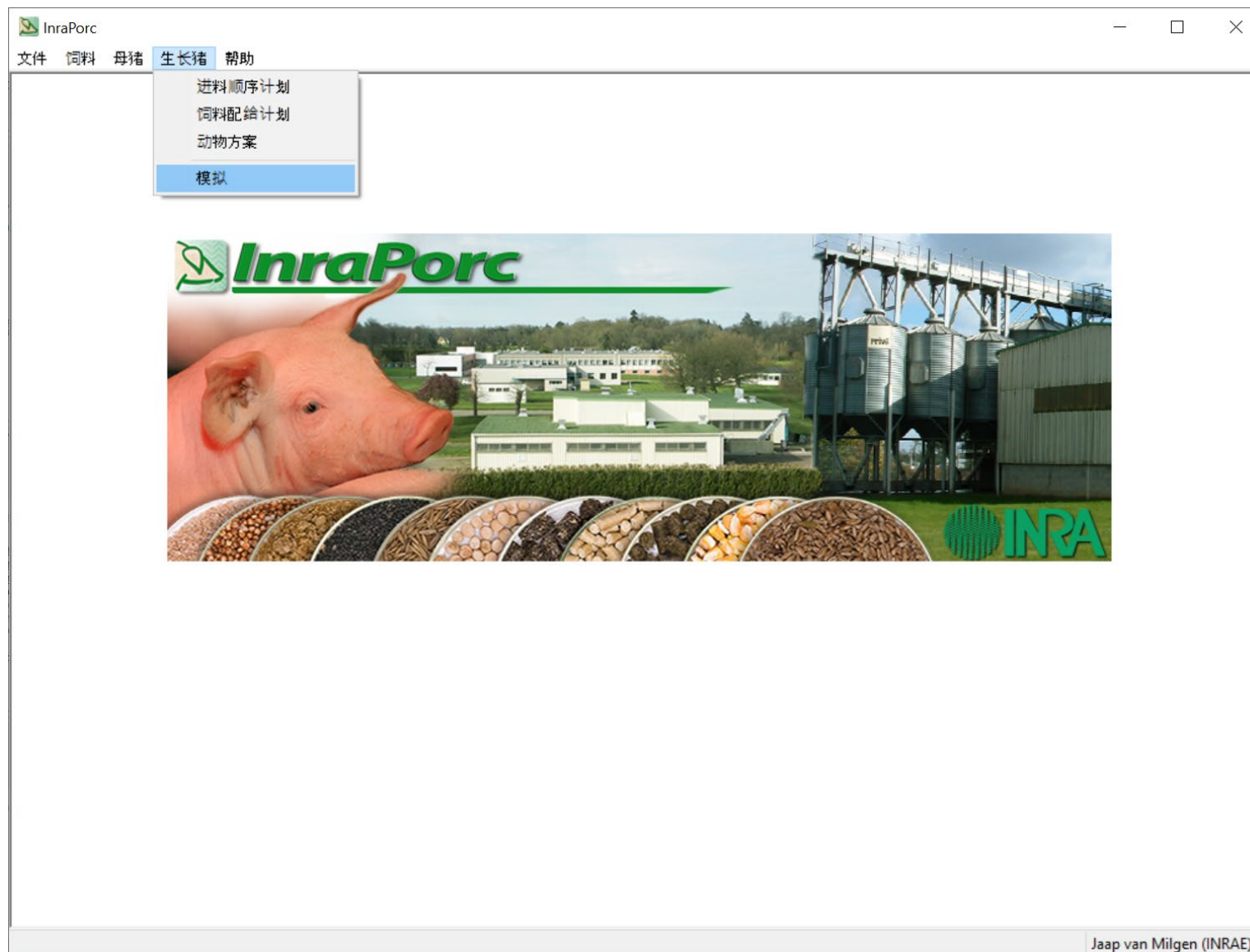
➤ Growing pigs: factorial calculation of amino acid requirements

生长猪：氨基酸需要量的析因计算



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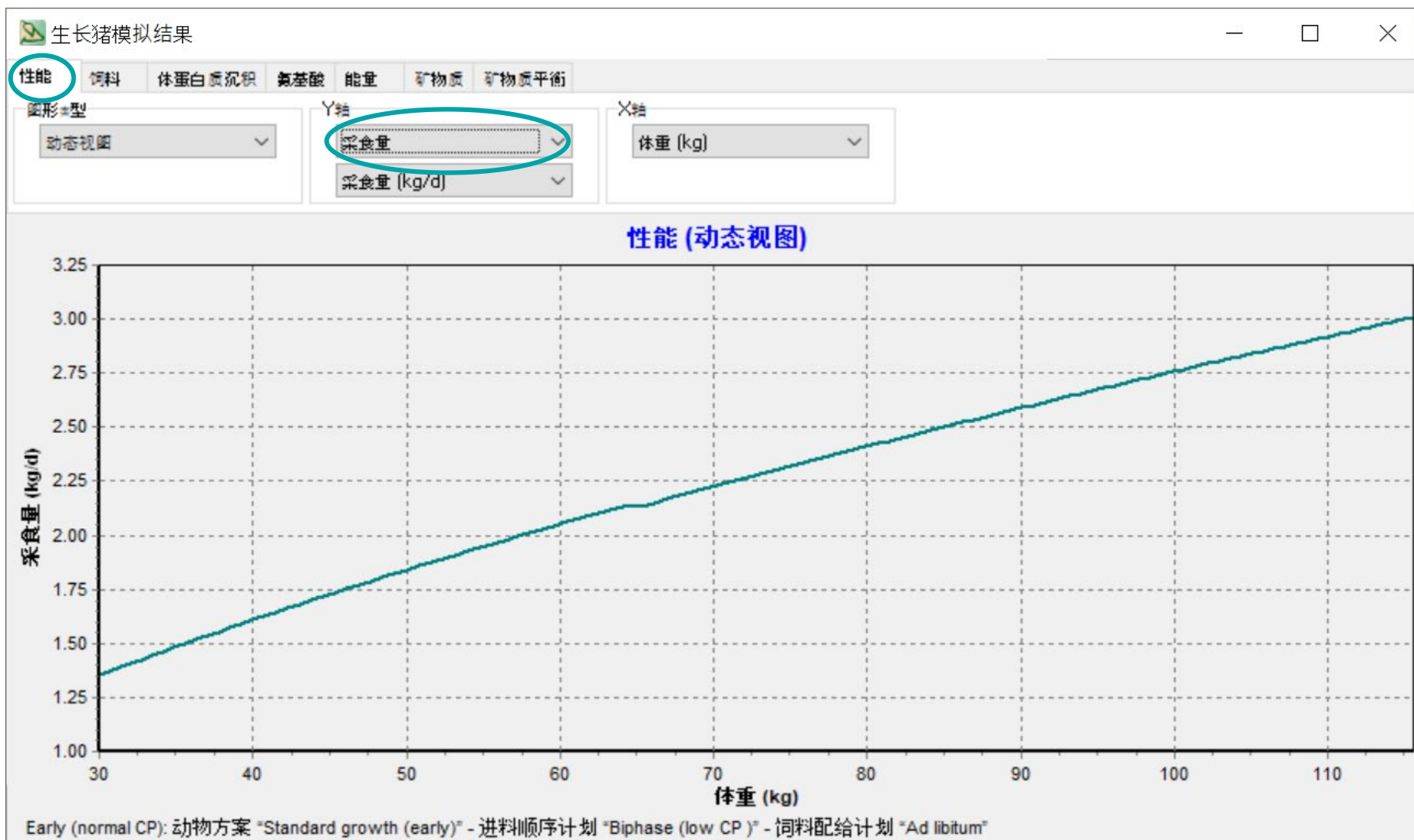
➤ Growing pigs: InraPorc 生长猪: InraPorc



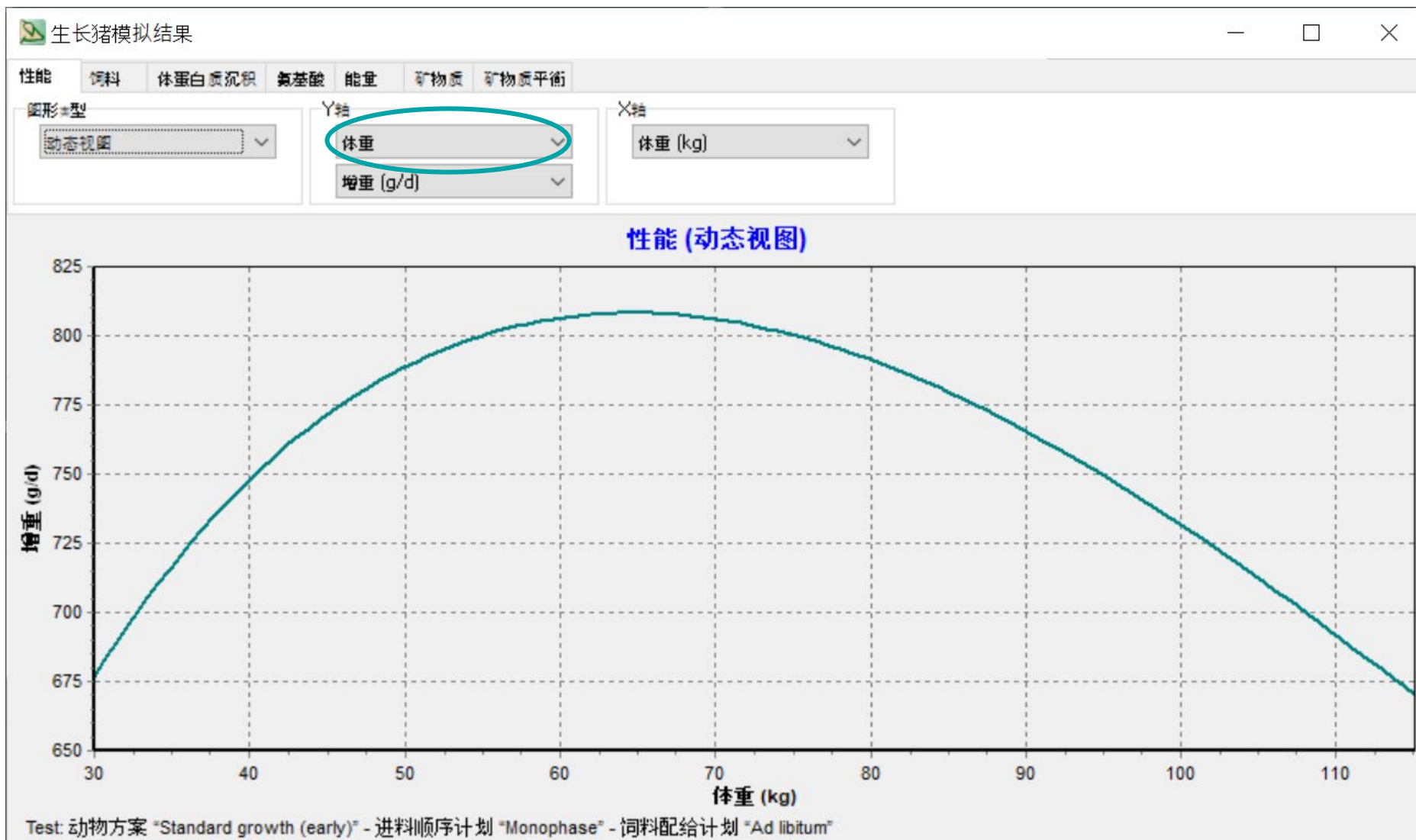
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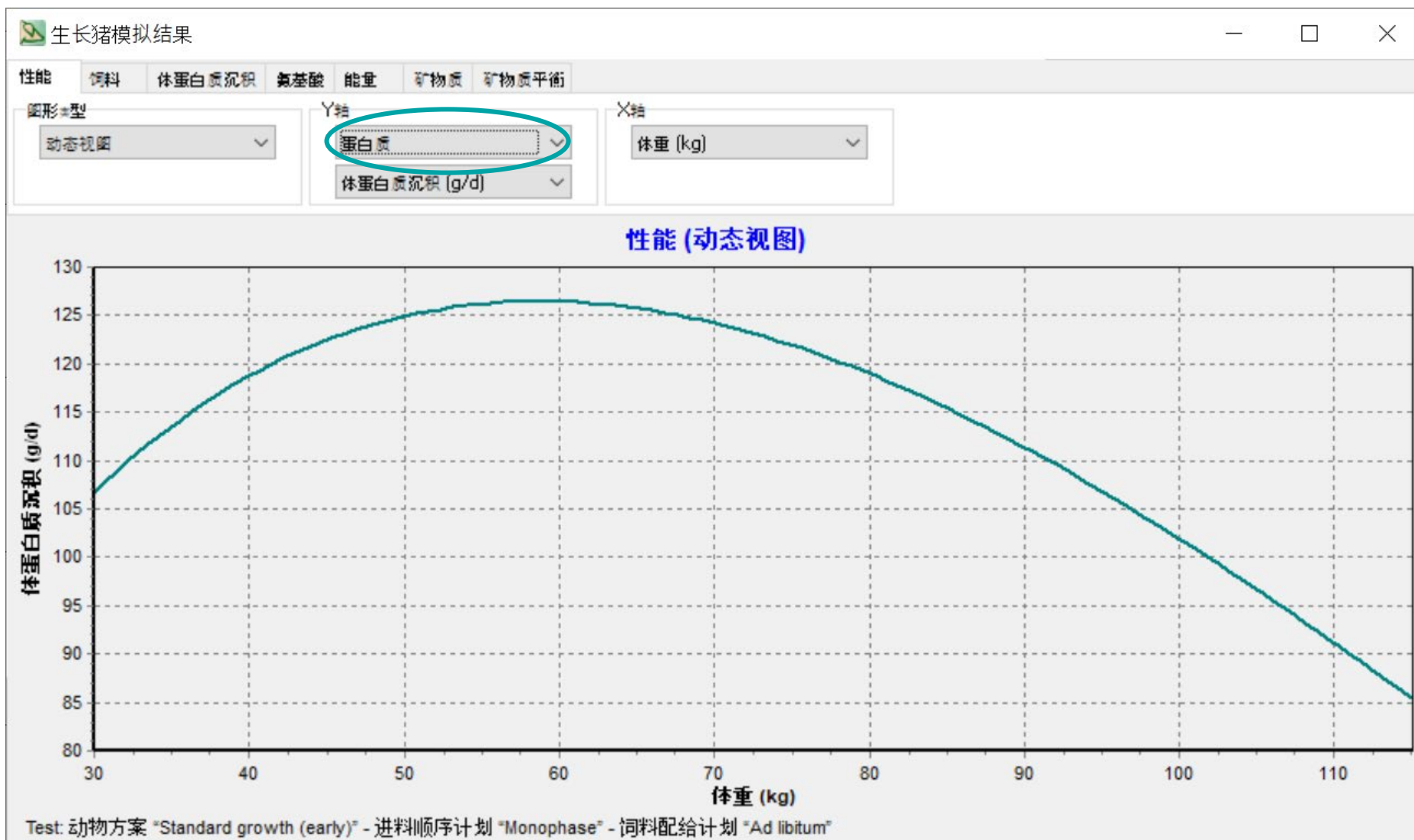
➤ Growing pigs: feed intake 生长猪：采食量



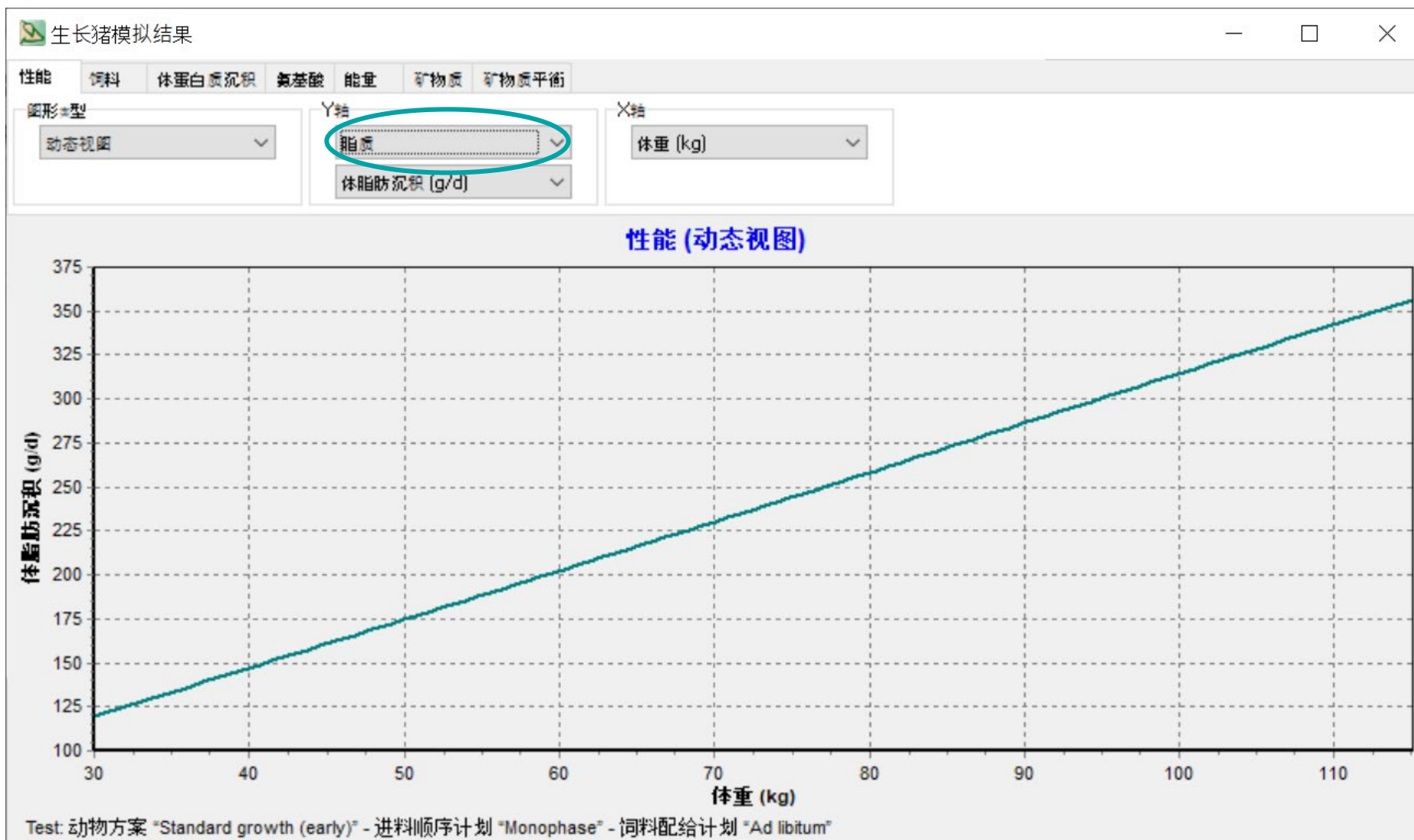
➤ Growing pigs: daily gain 生长猪：日增重



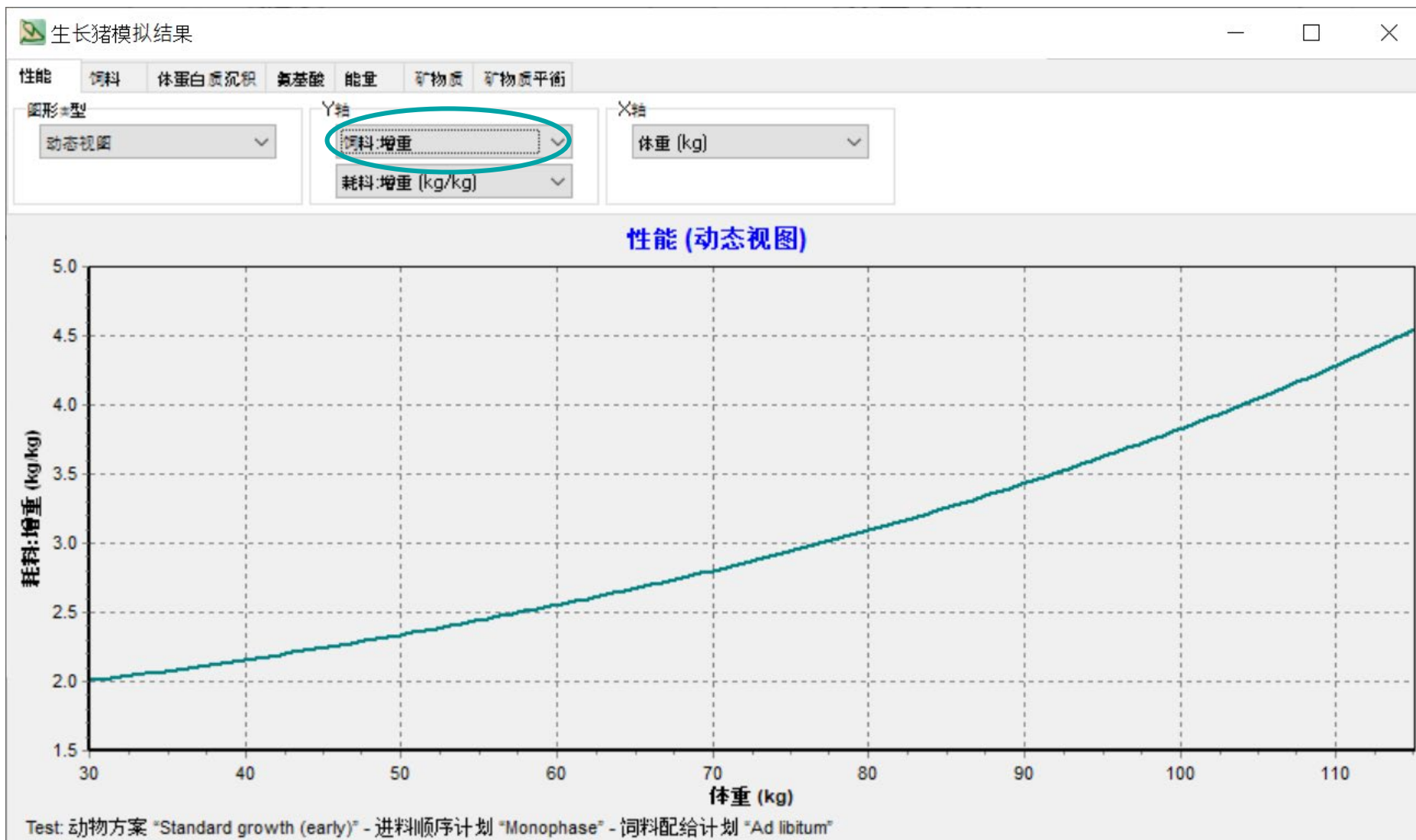
➤ Growing pigs: protein deposition 生长猪：蛋白质沉积



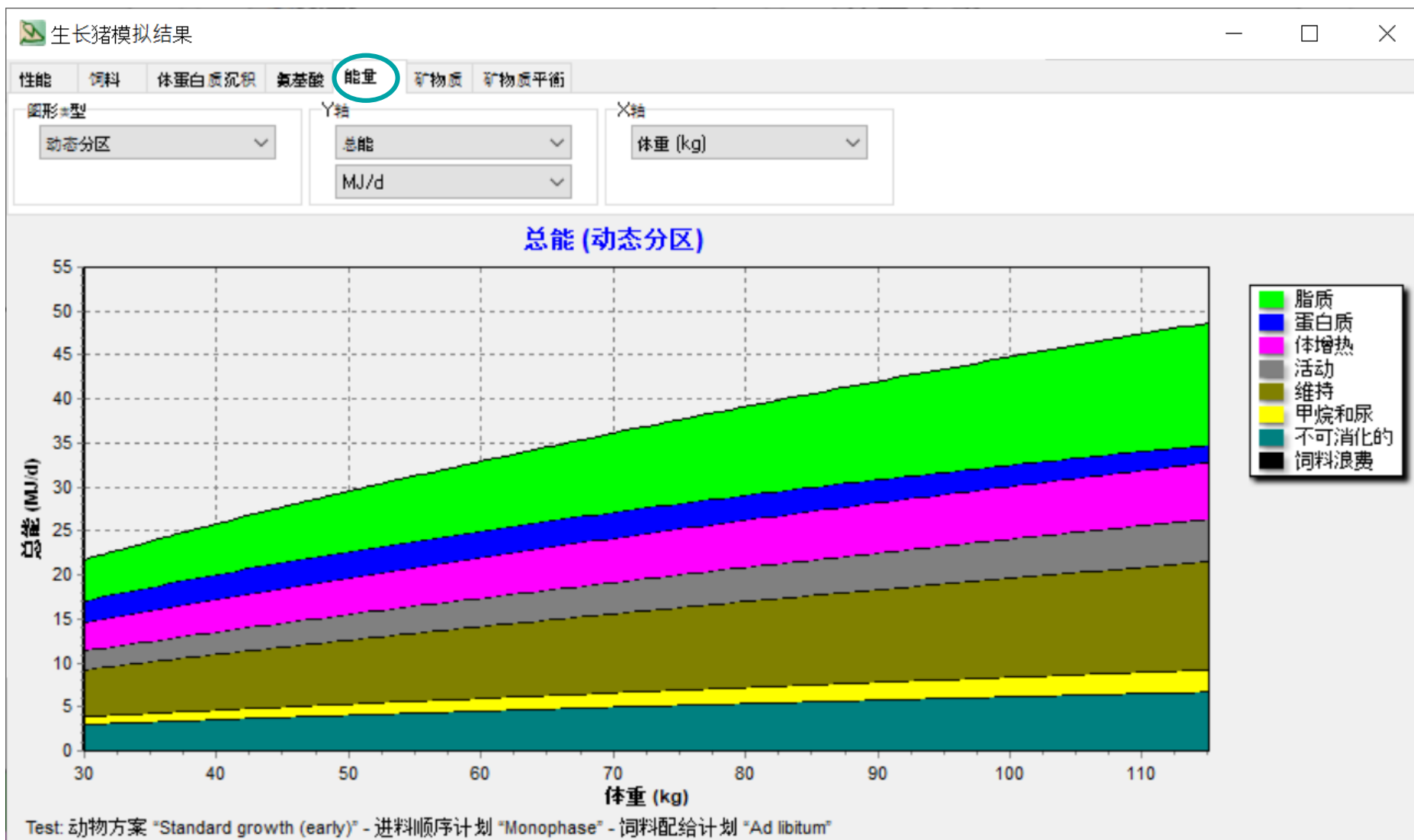
➤ Growing pigs: lipid deposition 生长猪：脂质沉积



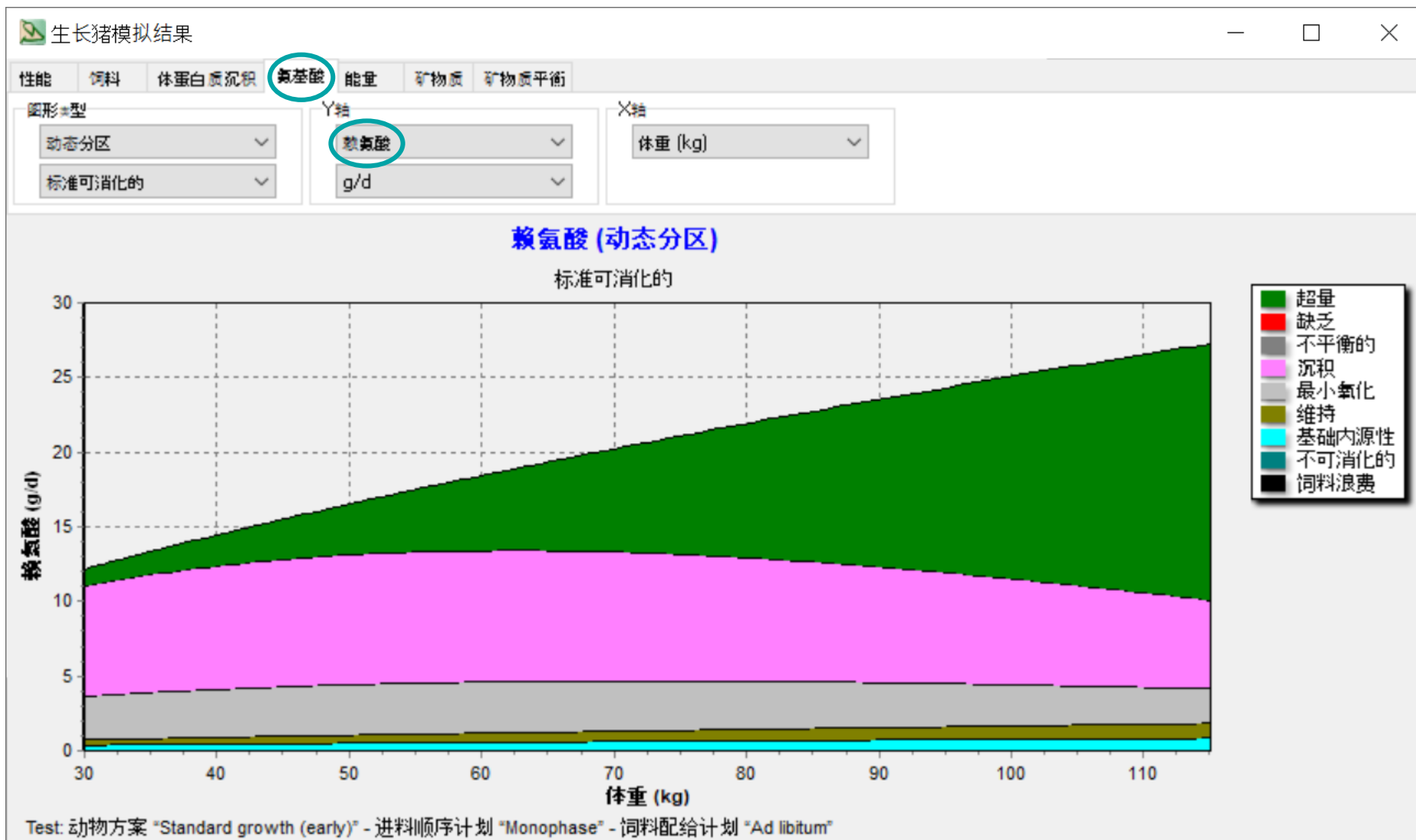
➤ Growing pigs: feed-to-gain ratio 生长猪：料肉比



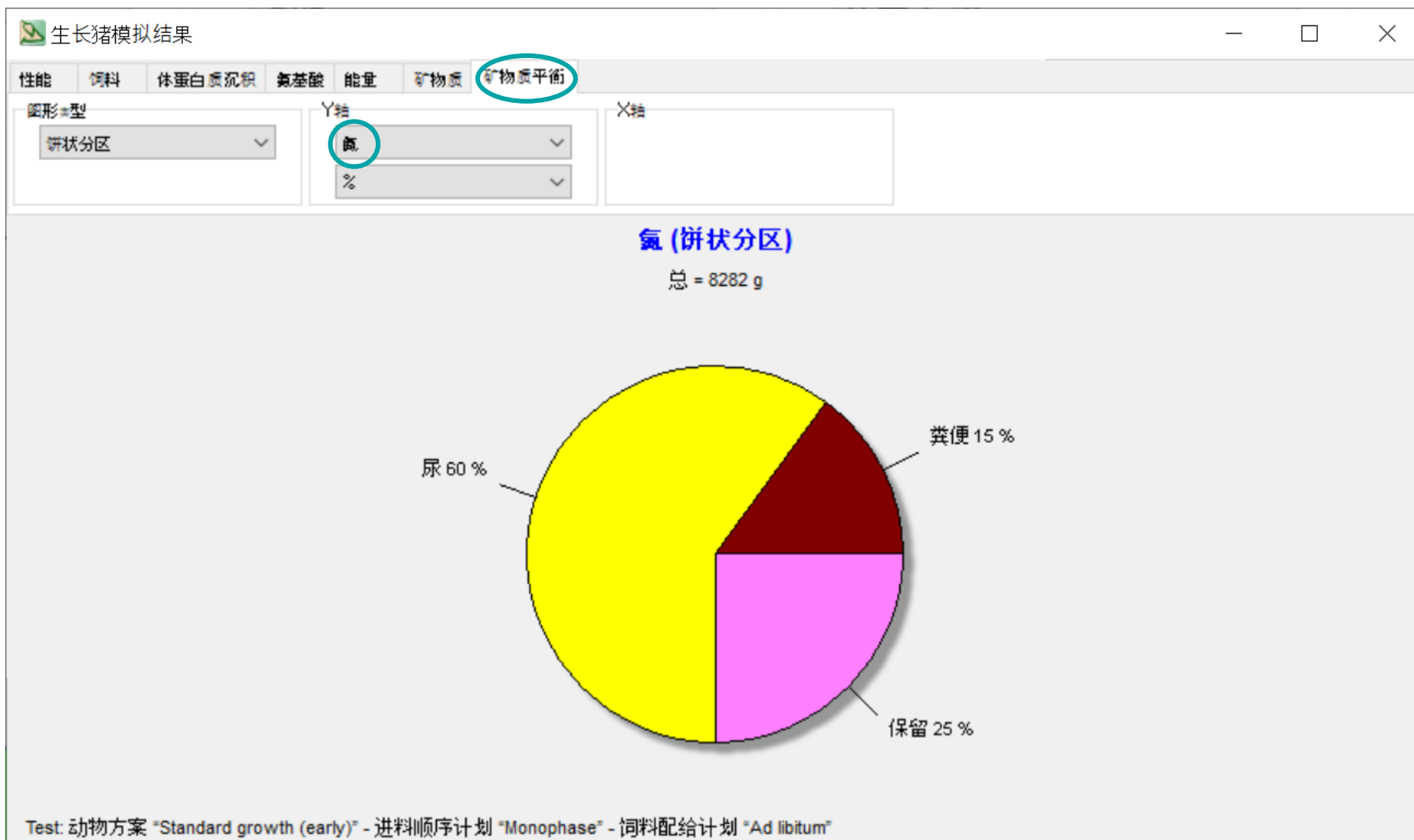
➤ Growing pigs: energy utilization 生长猪：能量利用



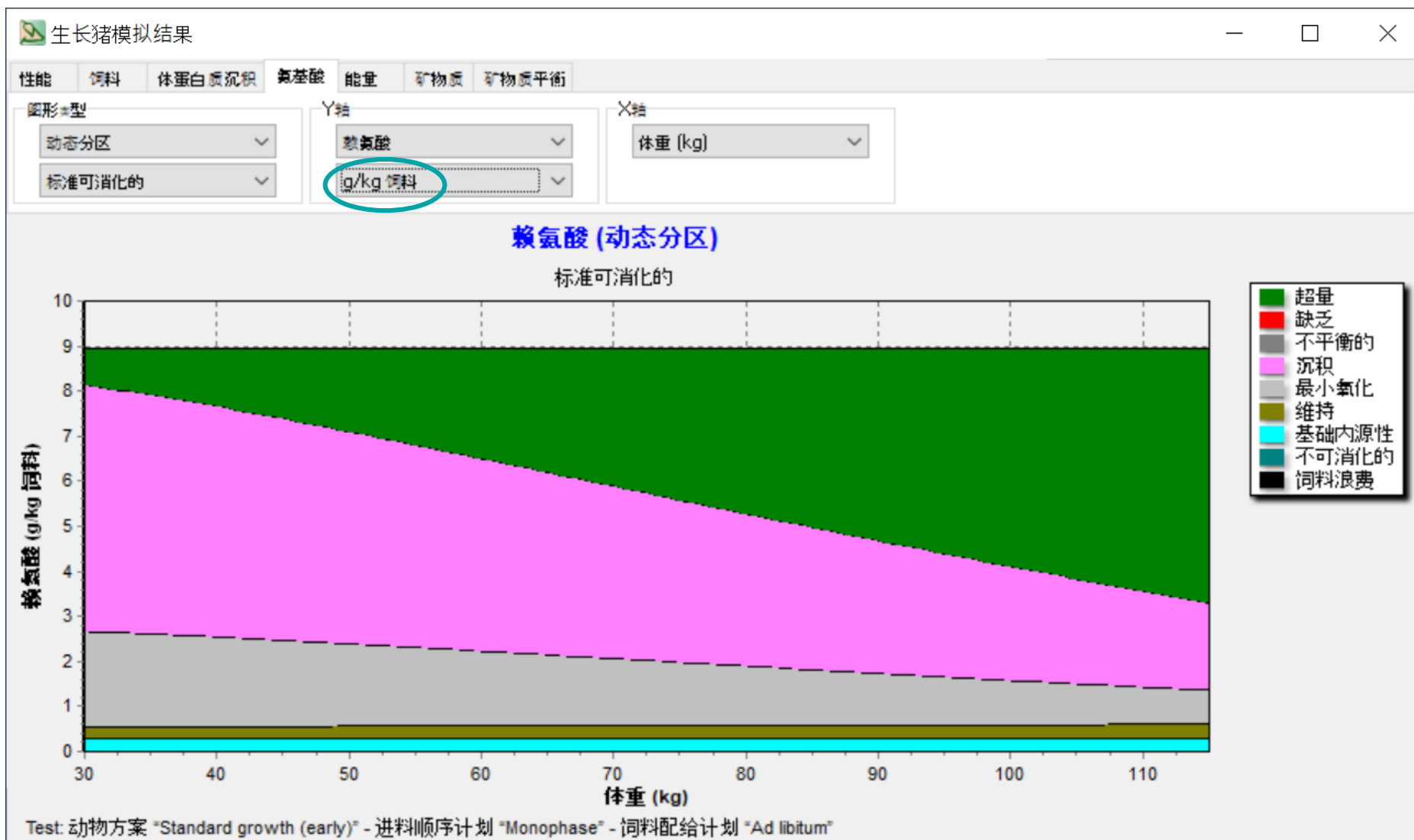
➤ Growing pigs: lysine utilization 生长猪：赖氨酸利用



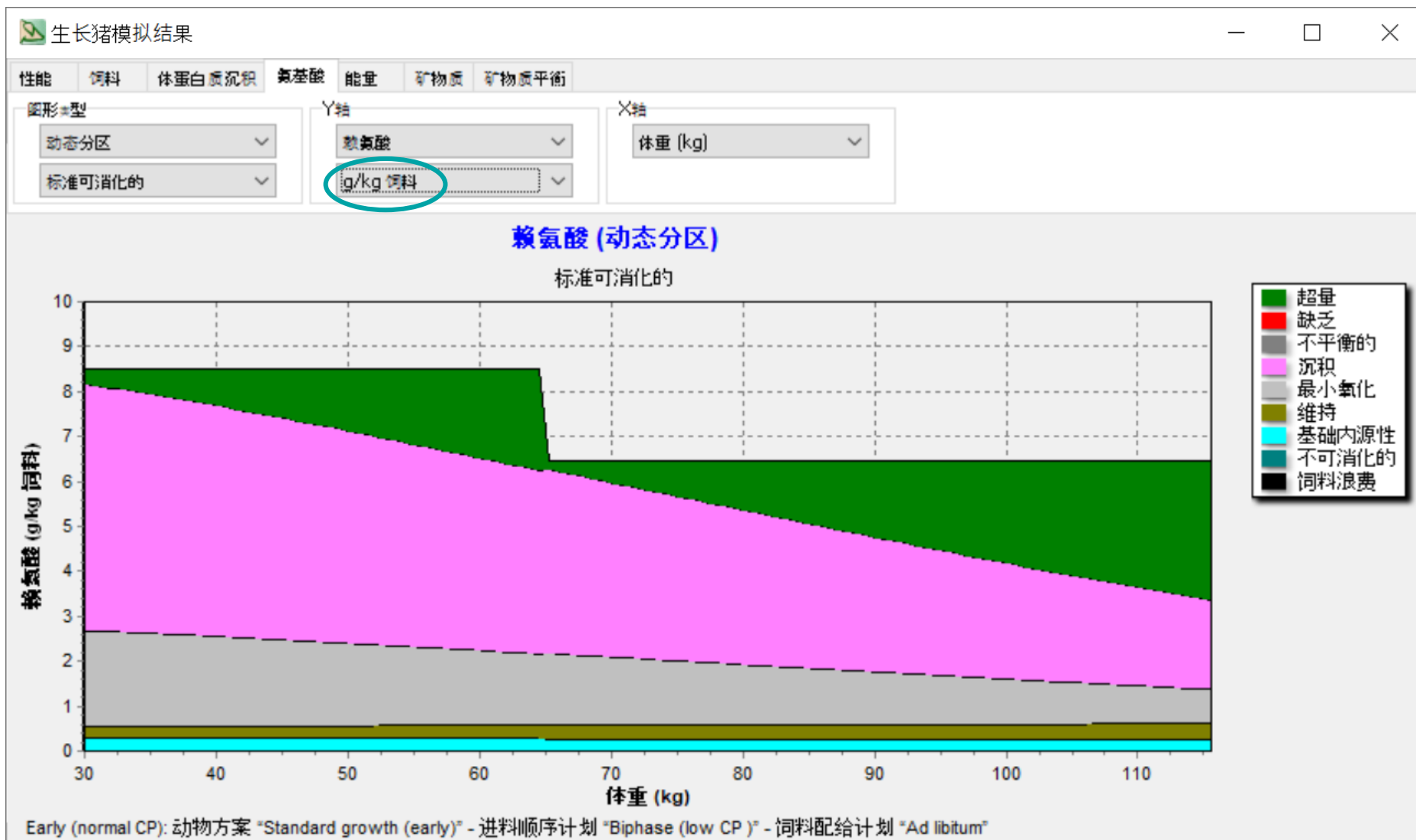
➤ Growing pigs: nitrogen utilization 生长猪：氮利用



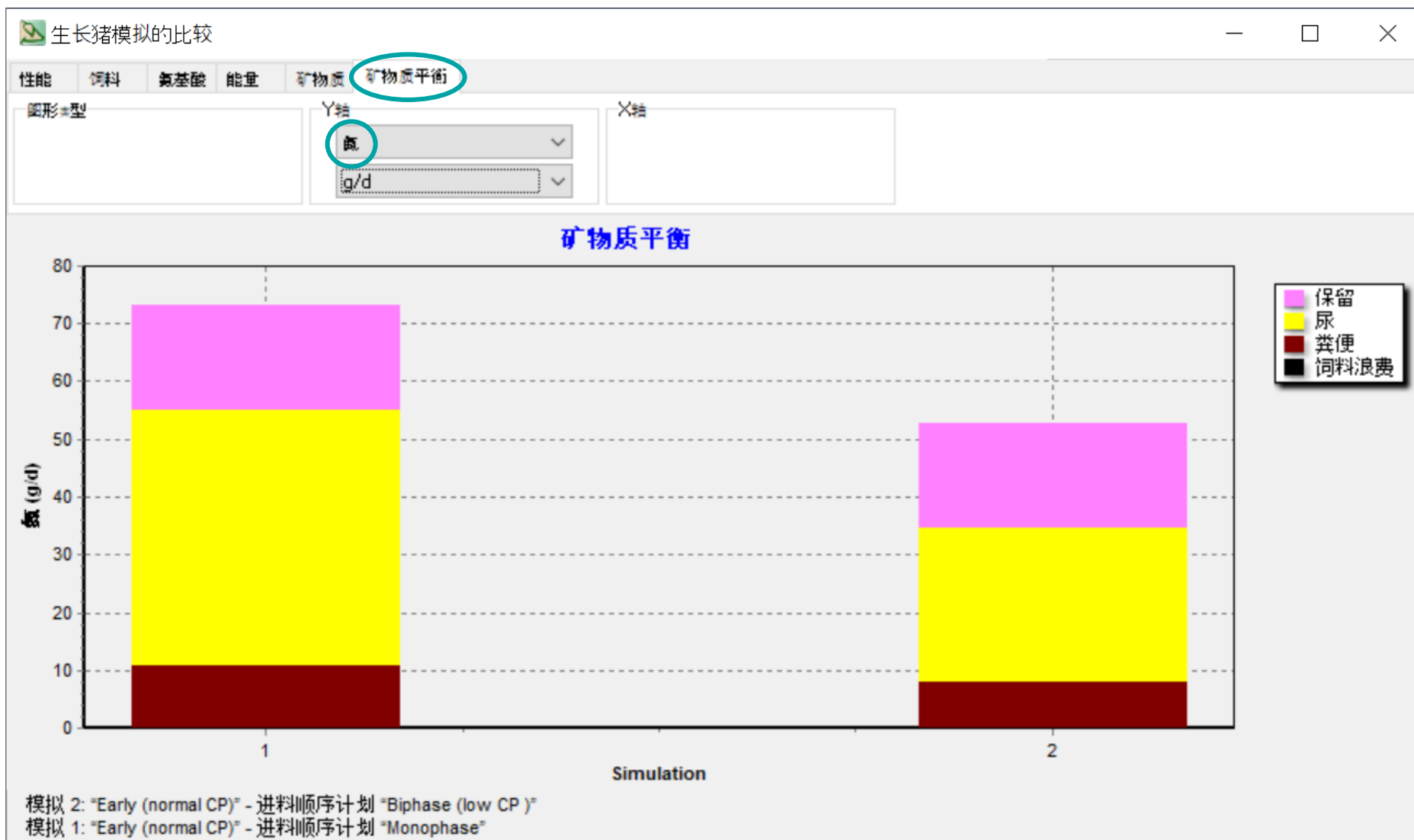
➤ Growing pigs: lysine utilization with one diet 生长猪：单日粮中的赖氨酸利用



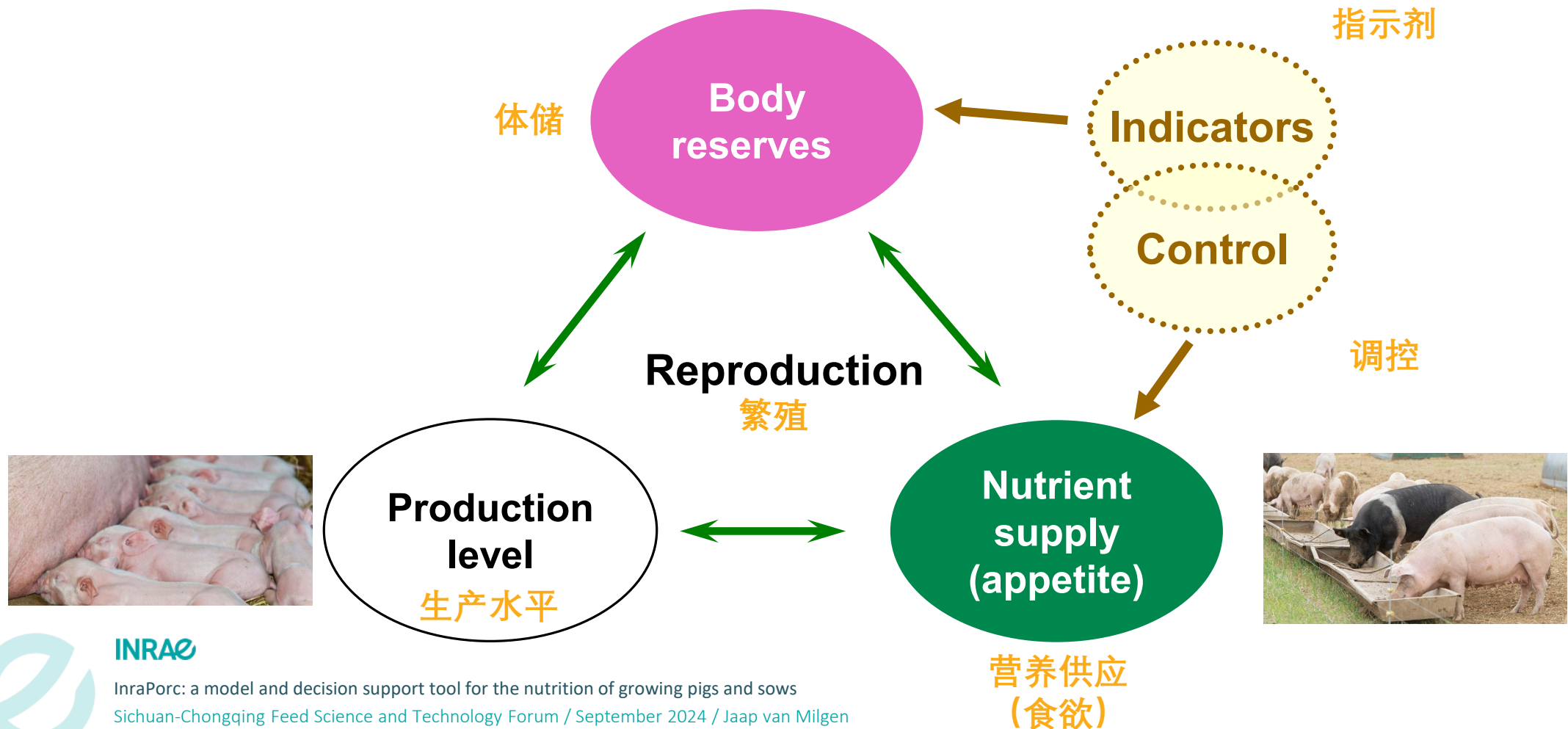
➤ Growing pigs: lysine utilization with two diets 生长猪：双日粮中的赖氨酸利用



➤ Growing pigs: comparing nutritional strategies 生长猪：营养策略对比



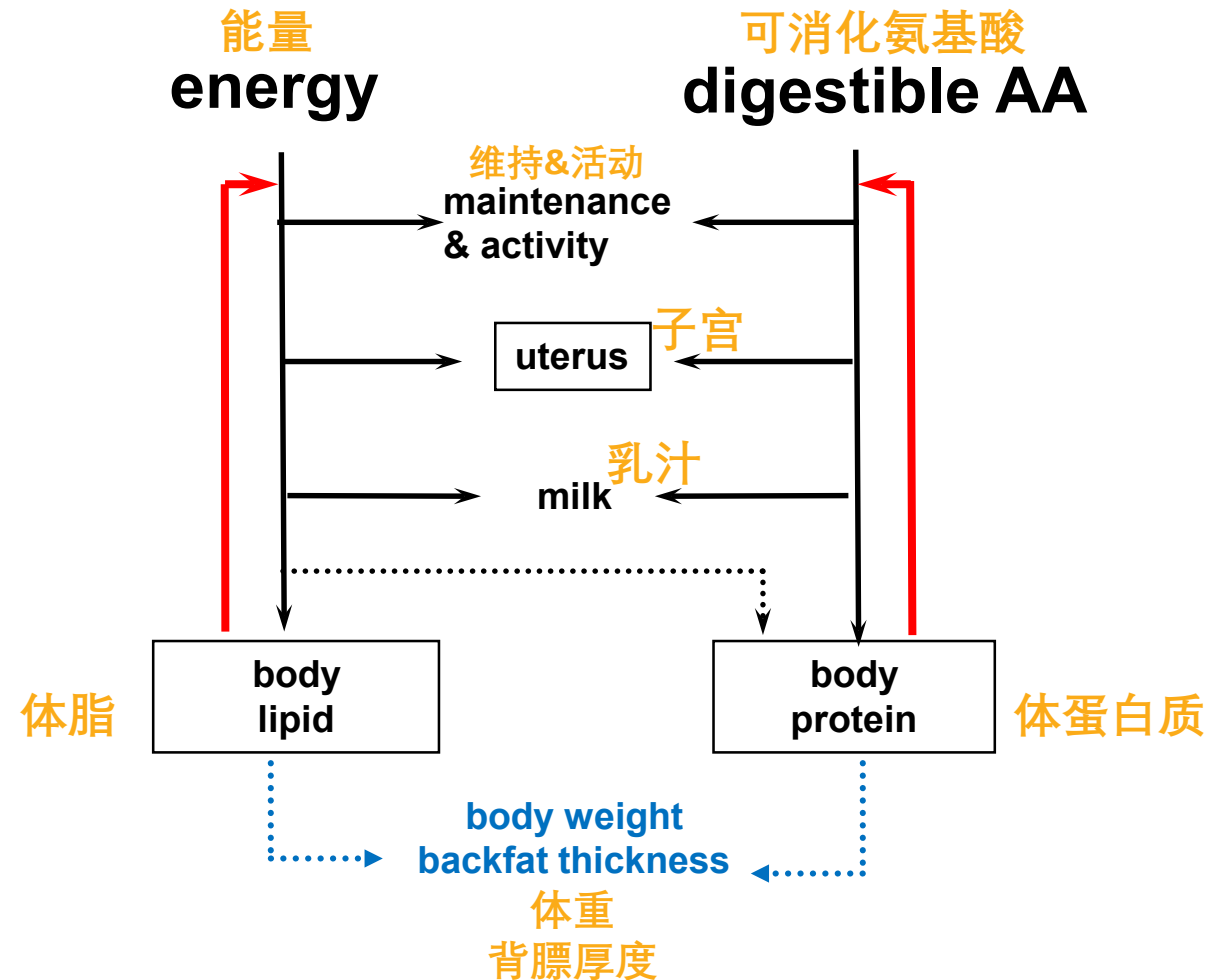
> Sows: feeding strategies 母猪：饲喂策略



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➤ Sows: energy and nutrient utilization 母猪：能量和养分利用



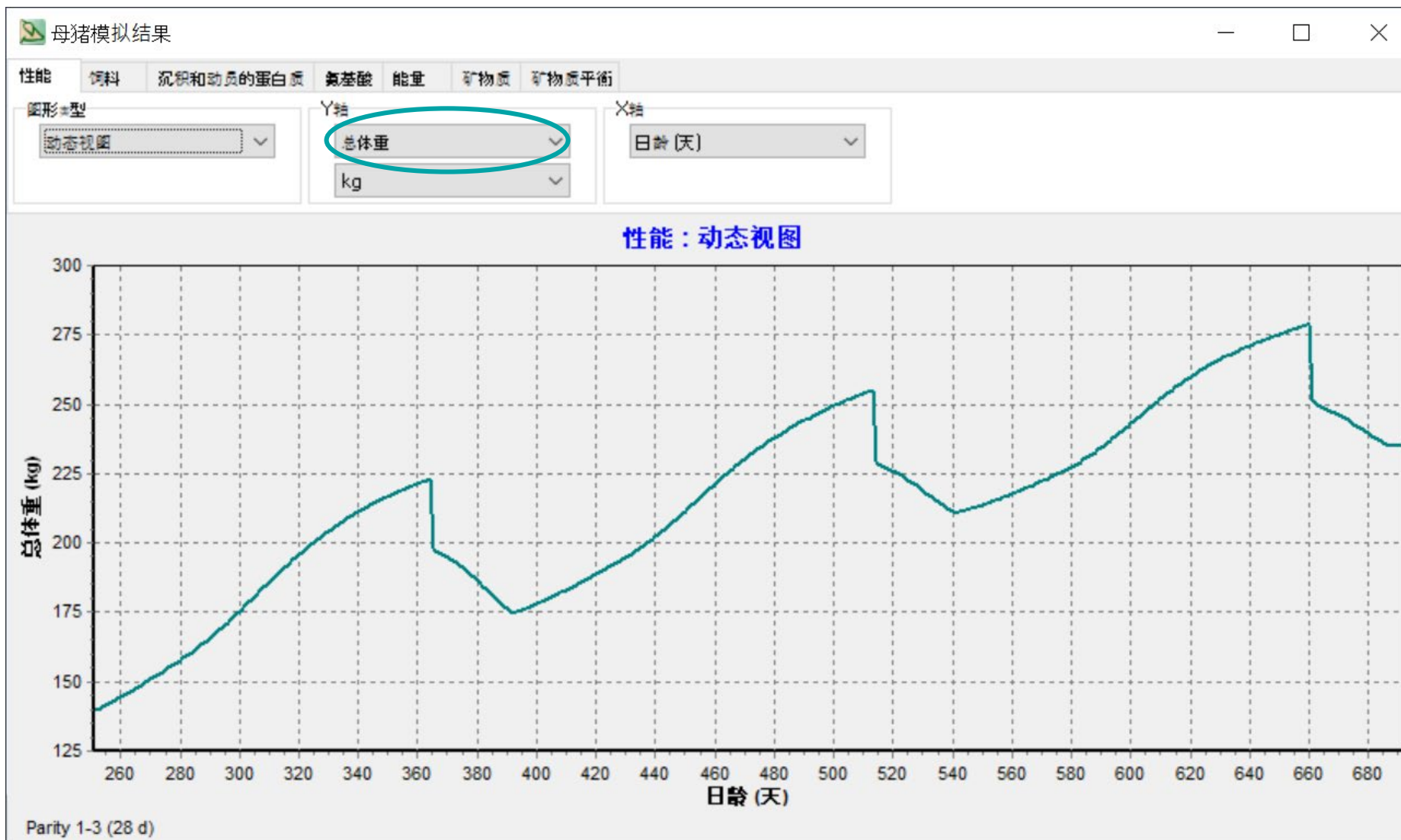
➤ Sows: InraPorc 母猪: InraPorc



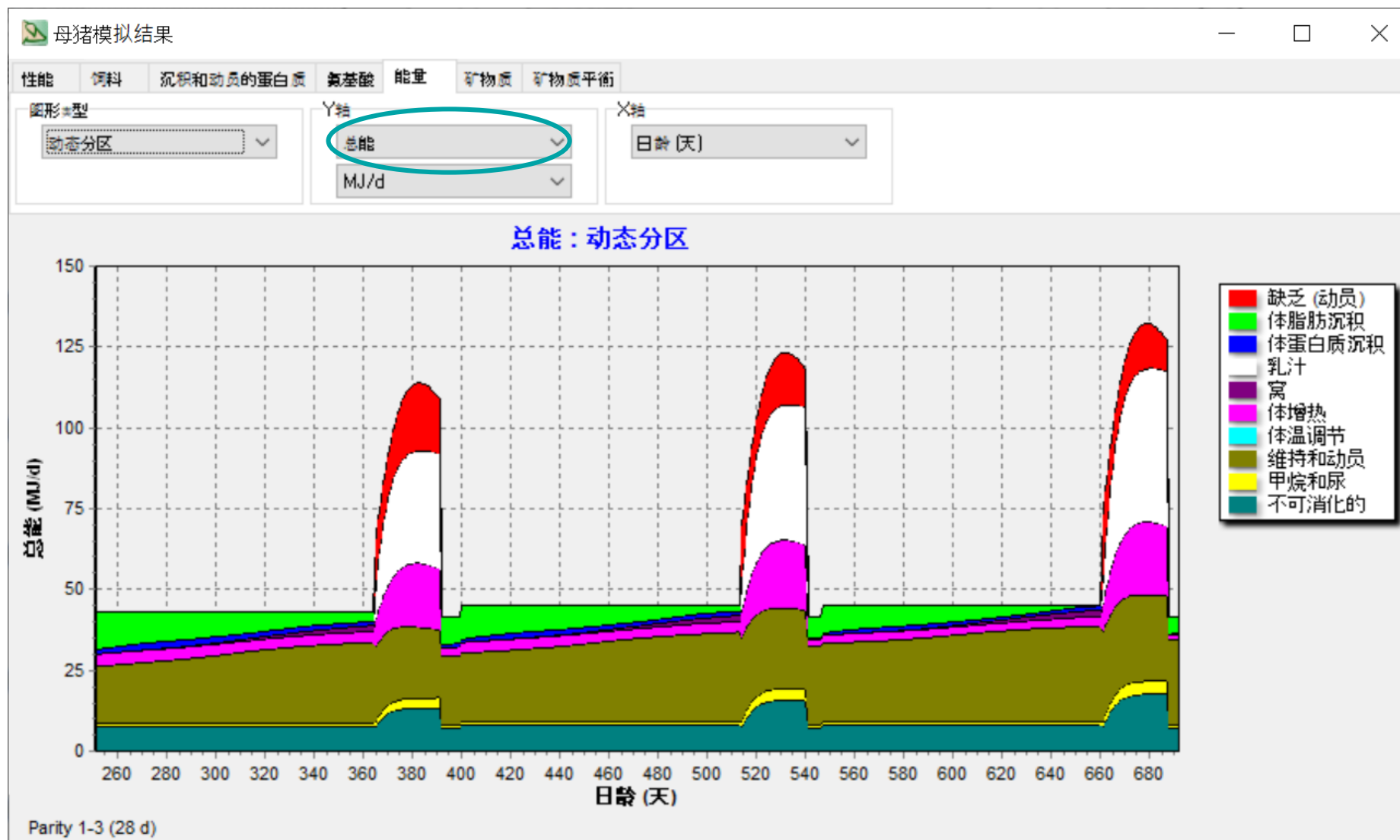
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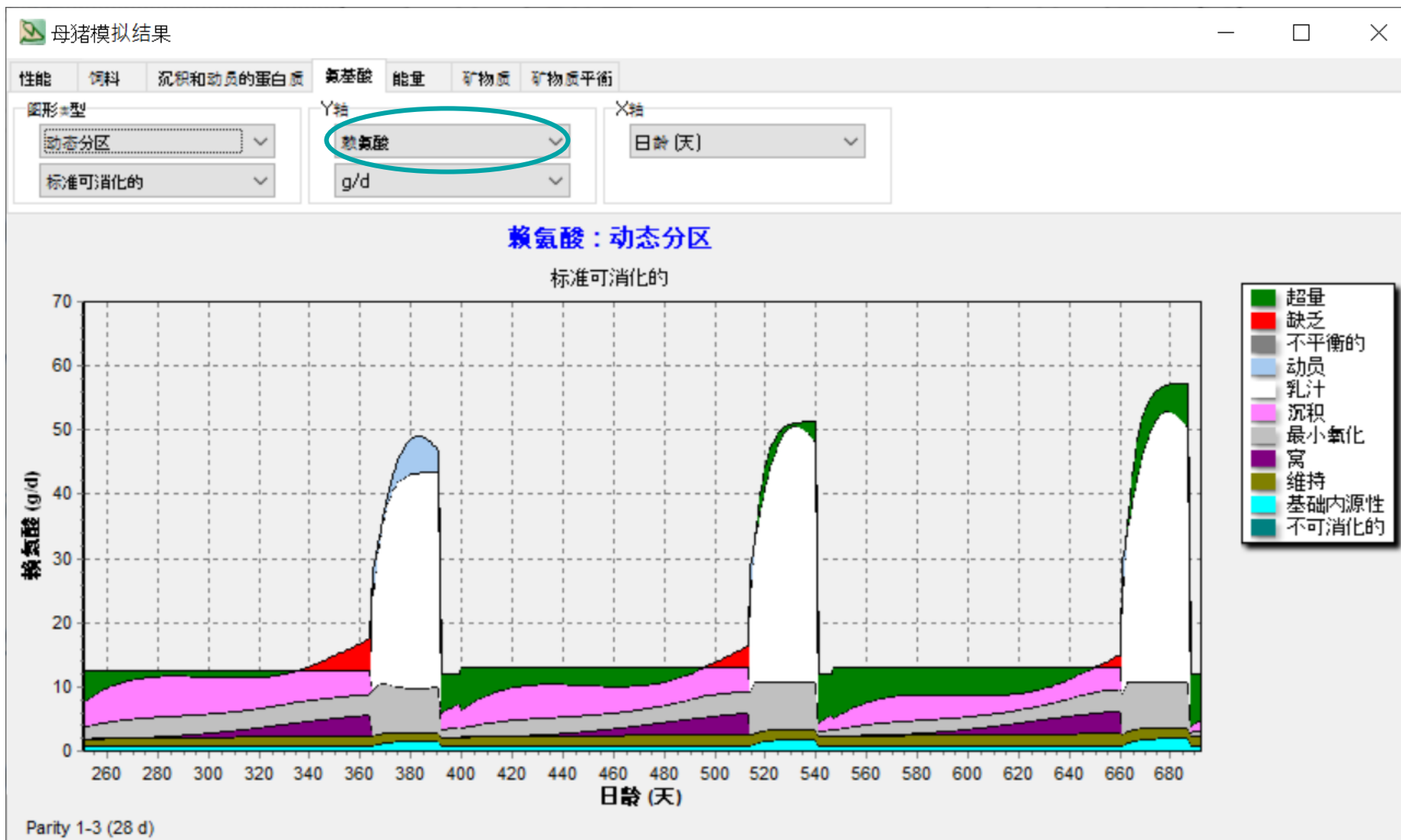
➤ Sows: body weight 母猪：体重



➤ Sows: energy utilization 母猪：能量利用



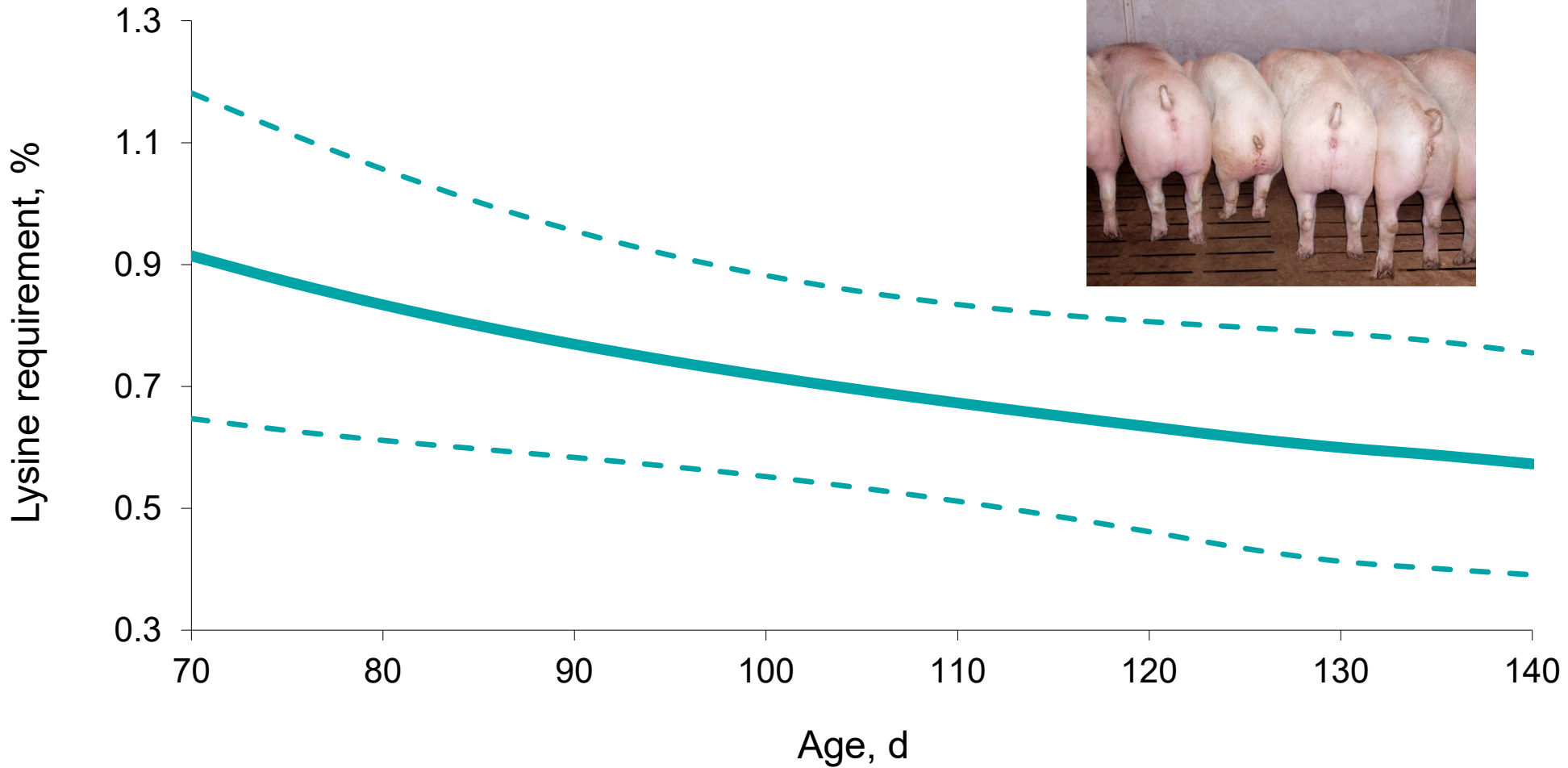
➤ Sows: lysine utilization 母猪：赖氨酸利用



➤ The use of models in precision livestock feeding: which animal in your population do you want to feed?

模型在家畜精准饲喂中的应用：你们想喂群体中的哪一只动物？

赖氨酸需要量



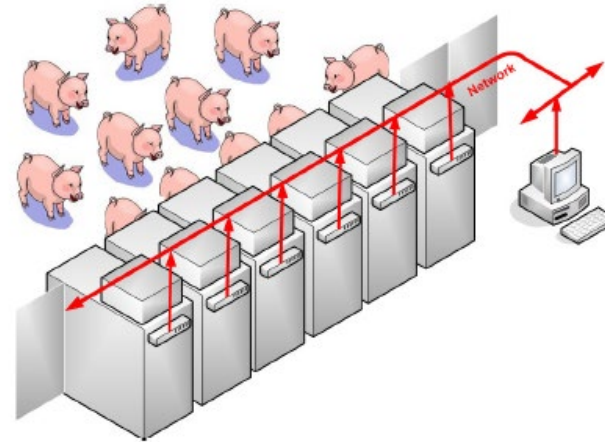
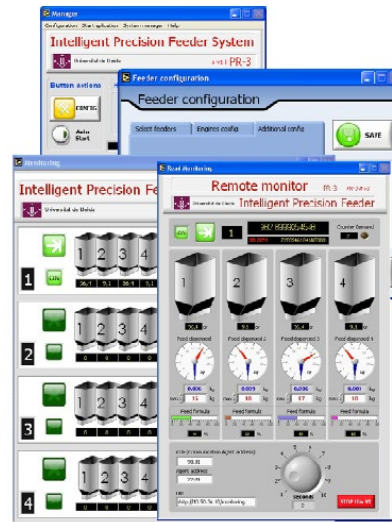
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➤ The use of models in precision livestock feeding: which animal in your population do you want to feed?

模型在家畜精准饲喂中的应用：你们想喂群体中的哪一只动物？



(个体) 精准家畜饲喂可以:

- 减少27%赖氨酸摄入
- 减少22~30%氮排泄
- 降低8~10%饲料成本

(Individual) Precision livestock feeding allows to:

- reduces lysine intake by 27%
- reduces nitrogen excretion by 22-30%
- reduced the feed cost by 8-10%

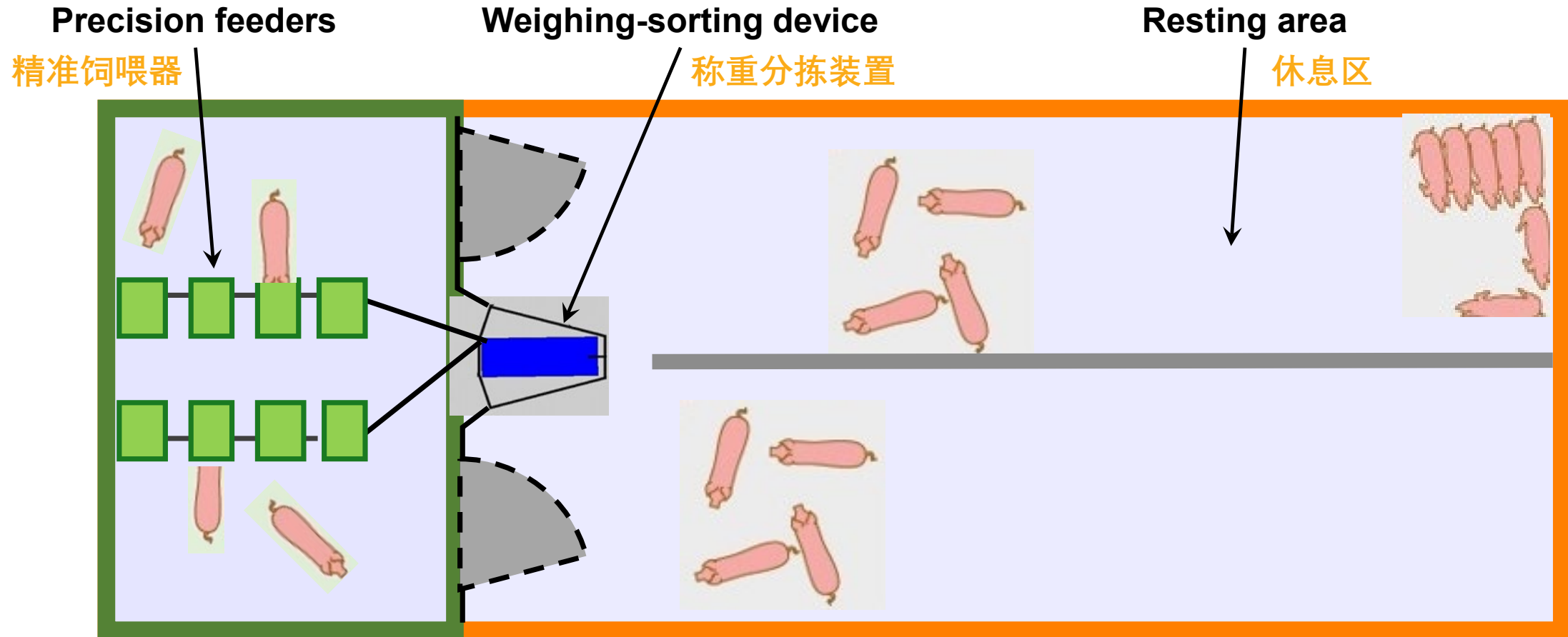


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➤ The use of models in precision livestock feeding: 模型在家畜精准饲喂中的应用:
revisiting the housing system 重新审视圈舍系统



➤ The use of models in precision livestock feeding: 模型在家畜精准饲喂中的应用:
revisiting the housing system 重新审视圈舍系统

休息区
Resting area



称重分拣装置
Weighing-sorting device

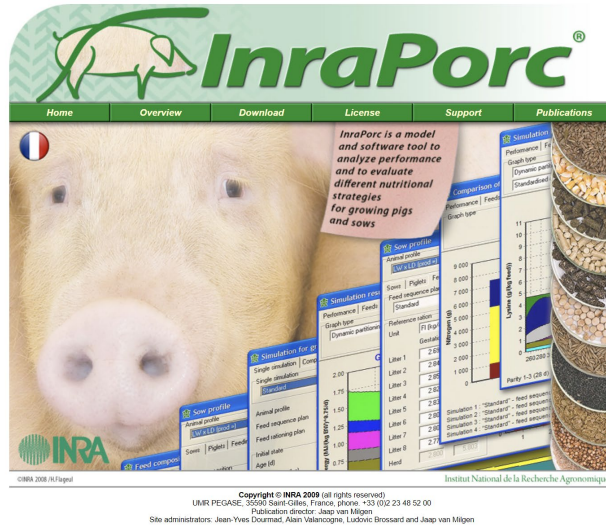


精准饲喂器
precision feeders



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➤ Conclusion 总结



https://inraporc.inrae.fr/inraporc/index_en.html

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InraPorc 已被用于动物营养教学

- InraPorc has been used to teach animal nutrition
- InraPorc is used by professional nutritionists to think about how the animal responds to the nutrient supply **InraPorc 被营养专家用于探究动物对营养供应的反应**
- Three modes of operation, with the same functionalities: **三个版本，功能完全相同**
 - Evaluation (free, but no information can be saved) **测试版（免费，无法存档）**
 - Education (free, some information can be saved) **教育版（免费，部分信息可存档）**
 - Complete (500€ + VAT, all information can be saved) **完整版（500欧元，不含税，可完整存档）**
- INRAE can provide training to use the tool (universities or companies) **INRAE可提供使用工具的培训（高校或企业）**
- The concepts of InraPorc are used in precision livestock nutrition **InraPorc的理念被用于精准家畜营养**