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Breeding for robustness in livestock is crucial



OBJECTIVES:

- (1) Detect perturbing impacts on feed intake of pigs
- (2) Characterize pig's responses to perturbations

- Resistance
 - Resilience
- } As elements of robustness

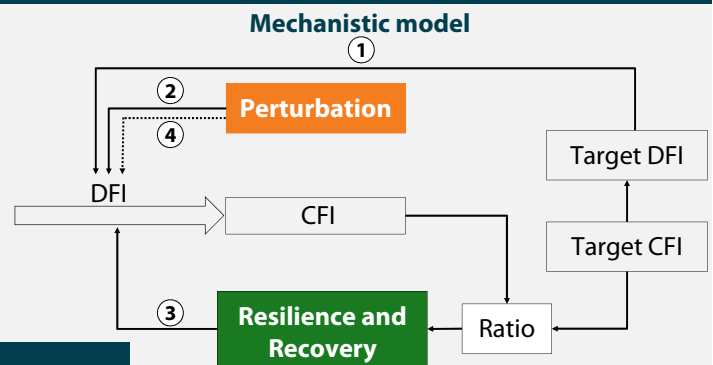
CONCLUSION

- ❖ This study provides a new method to detect perturbations and quantify resistance and resilience of livestock
- ❖ The only required input is daily feed intake
- ❖ The method can be used to compare the individual response of animals affected by a common perturbation in group-housed settings → Genetic Selection

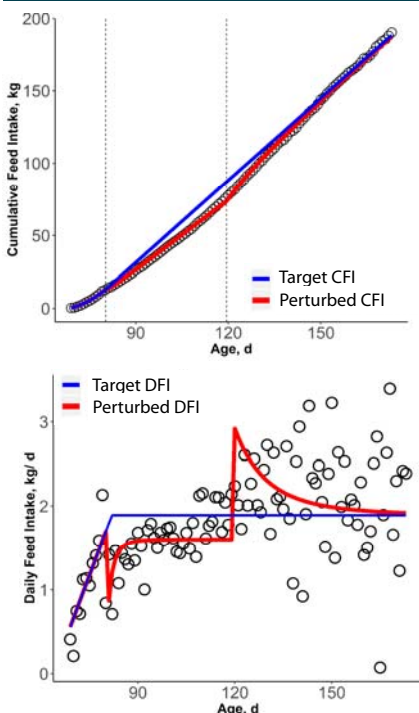
MATERIAL AND METHODS

A data analysis procedure and a model were developed to:

- ❖ Determine the **target trajectory of Cumulative Feed Intake (target CFI)**: amount of feed a pig desires to consume in a non-perturbed condition
- ❖ Detect consequences of perturbations on feed intake by the deviations of observations from target CFI
- ❖ Characterize pig's feed intake response using a mechanistic model



RESULTS



- The target CFI was estimated to correspond only to the highest observations of CFI

- The response of a pig to a perturbation was characterized by 4 parameters:

Start (day)	80
End (day)	119
Resistance (%)	-73
Resilience	3,74

- ① Absence of perturbation: Daily Feed Intake (DFI) = target DFI
- ② During perturbation: DFI ↓ → CFI starts to deviate from target CFI
- ③ Ratio between CFI and target CFI induces resilience and recovery mechanism
- ④ Perturbation is over: DFI ↑ → Through compensatory DFI, the CFI approaches target CFI and the pig recovers

- **Start** and **End** time of the perturbation
- **Resistance**: immediate reduction in DFI (%) at the start of the perturbation
- **Resilience**: capacity to limit the effect of the perturbing factor and to recover afterwards (e.g., if the CFI is 1% below the target CFI → Pig consumes 3.74% more than its target DFI)



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This study receives funding from European Union's H2020 project **Feed-a-Gene**, #DigitAg and INRA – ACCAF

