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Pig production and PLF issues in South Australia

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Acknowledgement



- Scientific support of BrightAnimal and PLF collaborators
- Financial contribution of



Introduction

- South Australia is roughly equivalent to France and Germany together but only 1.4 million inhabitants
- Per capita GDP is ca 48,000USD (significantly higher than Germany & France)
- This leads naturally to higher agricultural labour costs, around 14EUR/h
- South Australian slaughters around 1.1 million pigs/year and has a self-sufficiency index of 250%.
- Batch farrowing is accepted practice and there is no clear regional product differentiation



NCEA



Evidence of PLF in SA



- Generally slow uptake of technologies due to lack of demonstrated pay-back
- Readily adopted technologies:
 - Advanced climate control systems
 - Pregnancy testing using ultrasounds equipment on some farms (provided as a service by vets)

Potential areas for PLF technologies

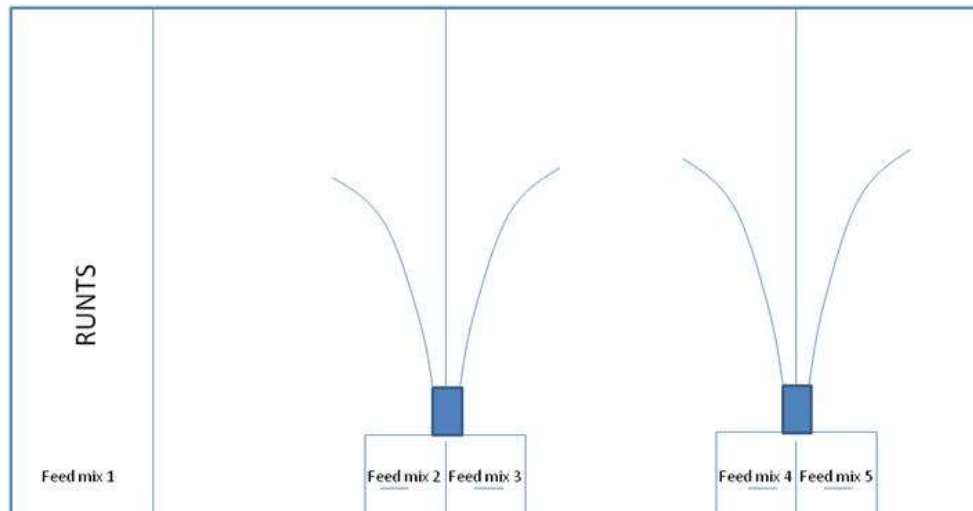


- Critical issues that could be addressed potentially by precision livestock farming methods
 - Multi-phase feeding
 - Automated weighing
 - Improved climate control
 - Heat detection

Special case of “Target Hill



- Feed intake (via liquid feeding system), animal weight (via Osborne weighing-sorting scales) and climatic conditions (via fully climate controlled sheds) were monitored continuously





- 1. Ultimate solution: individualised feeding according to weight and environmental condition**
- 2. First step in the right direction: adaption of multi-phase feeding approach & measurement of feed intake**
- 3. Recently published economical modelling predicted an annual return of 1.35€-1.88€ per pig space when feed composition was optimised daily compared with a two phase approach***
- 4. To achieve these aims an innovative feed sensor was developed recently in SA****

* J.K.Niemi et al. (2010) The value of precision feeding technologies for grow–finish swine, *Livestock Science* 129 p. 13-23

** T.M. Banhazi et al. (2009) Field evaluation of a prototype sensor for measuring feed disappearance in livestock buildings, *Australian Journal of Multi-disciplinary Engineering*, Vol. 7, No. 1, pp. 27-38.

Functional Sensor Flow Diagram



A- Dry feed system is initiated to deliver granulated feed to individual feeders



B- Feed begins to flow through the feed pipe and the sensor



C- The feed sensor recognises the feed episode and begins calculating the feed flow rate



D- The feed episode ends and the sensor performs the required signal processing steps to integrate measurements



E- The information is sent to the farm computer at a remote location

Results: measured vs. predicted feed weight

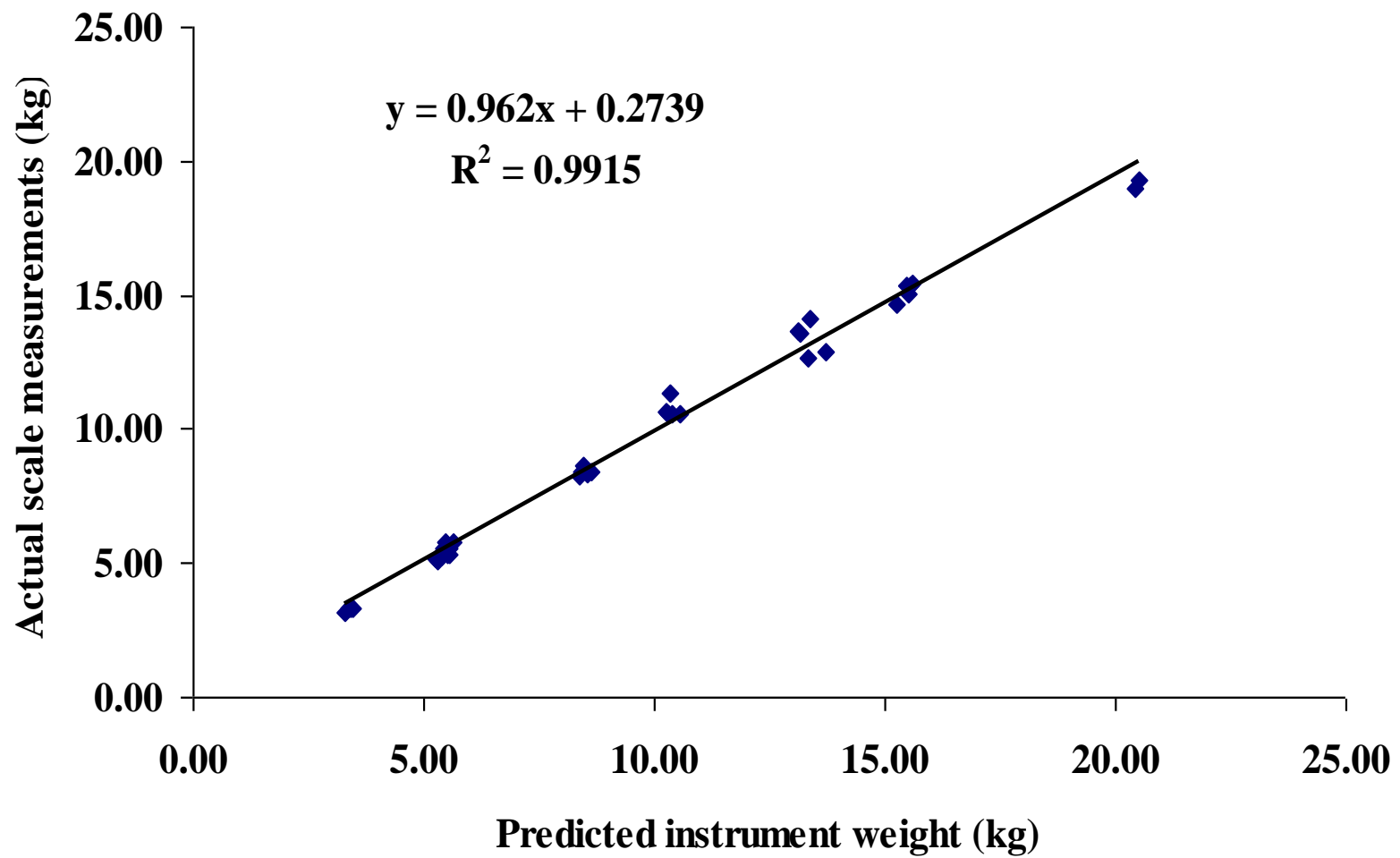


Image analysis based feed sensor was also developed in Australia

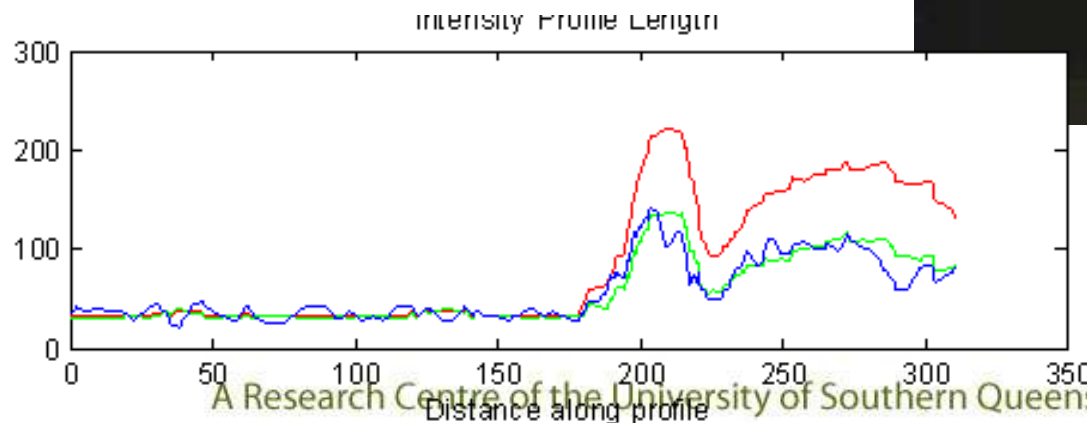


- Routine and non-invasive measurement of animal weight is useful information (Banhazi et al. 2007a)
- Currently used methods are labour intensive, stressful and/or not precise enough (Black 2001b; 2002)
- Adoption and improved use of “IA” techniques combined with statistical modelling might offer a practical solution for this problem
- Therefore, the aims of a PORK CRC funded study was to develop and field test a robust and cost effective IA based weighing system under realistic farm conditions

Pig identification in the images



Lines of Interest



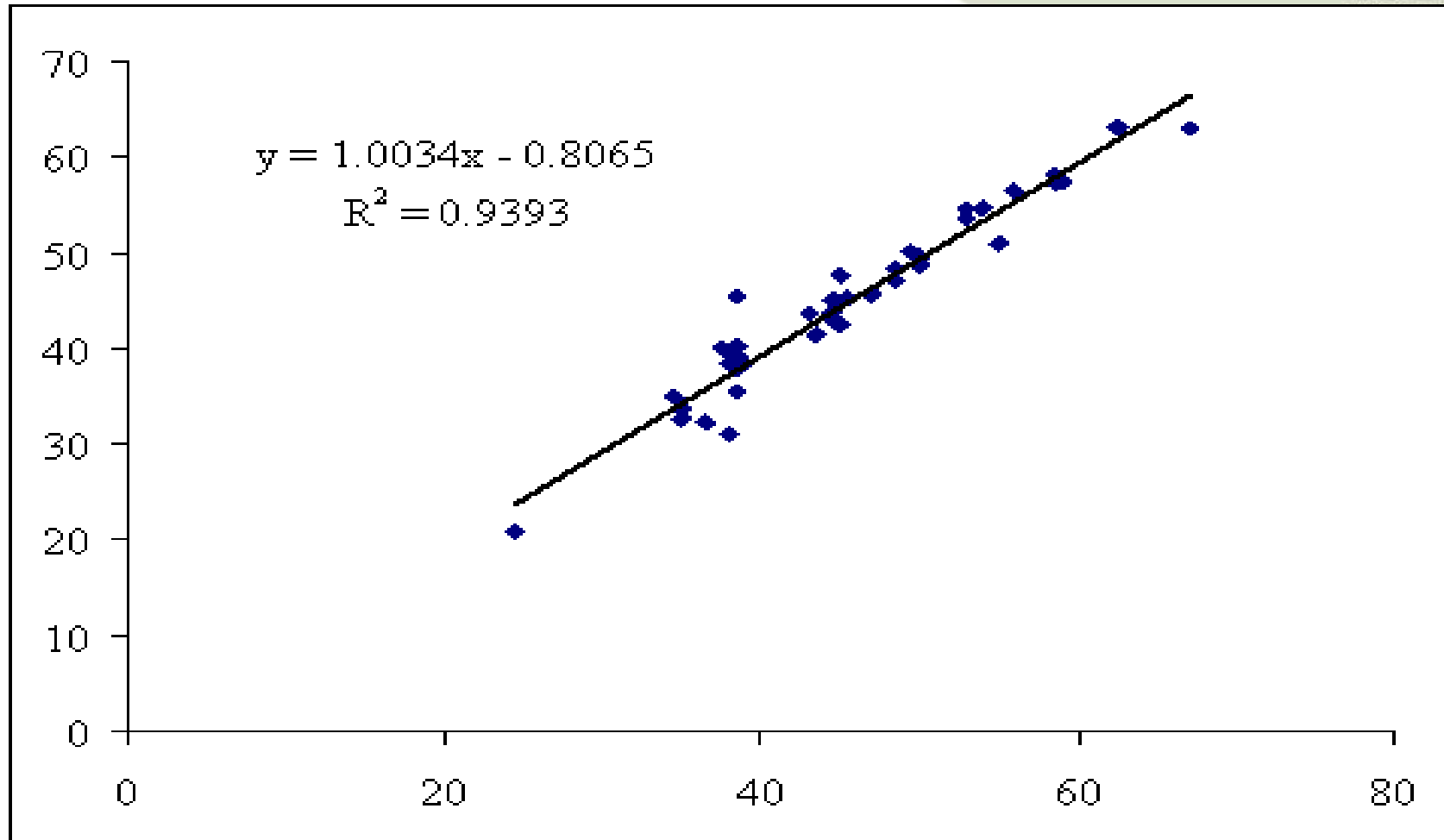
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Results

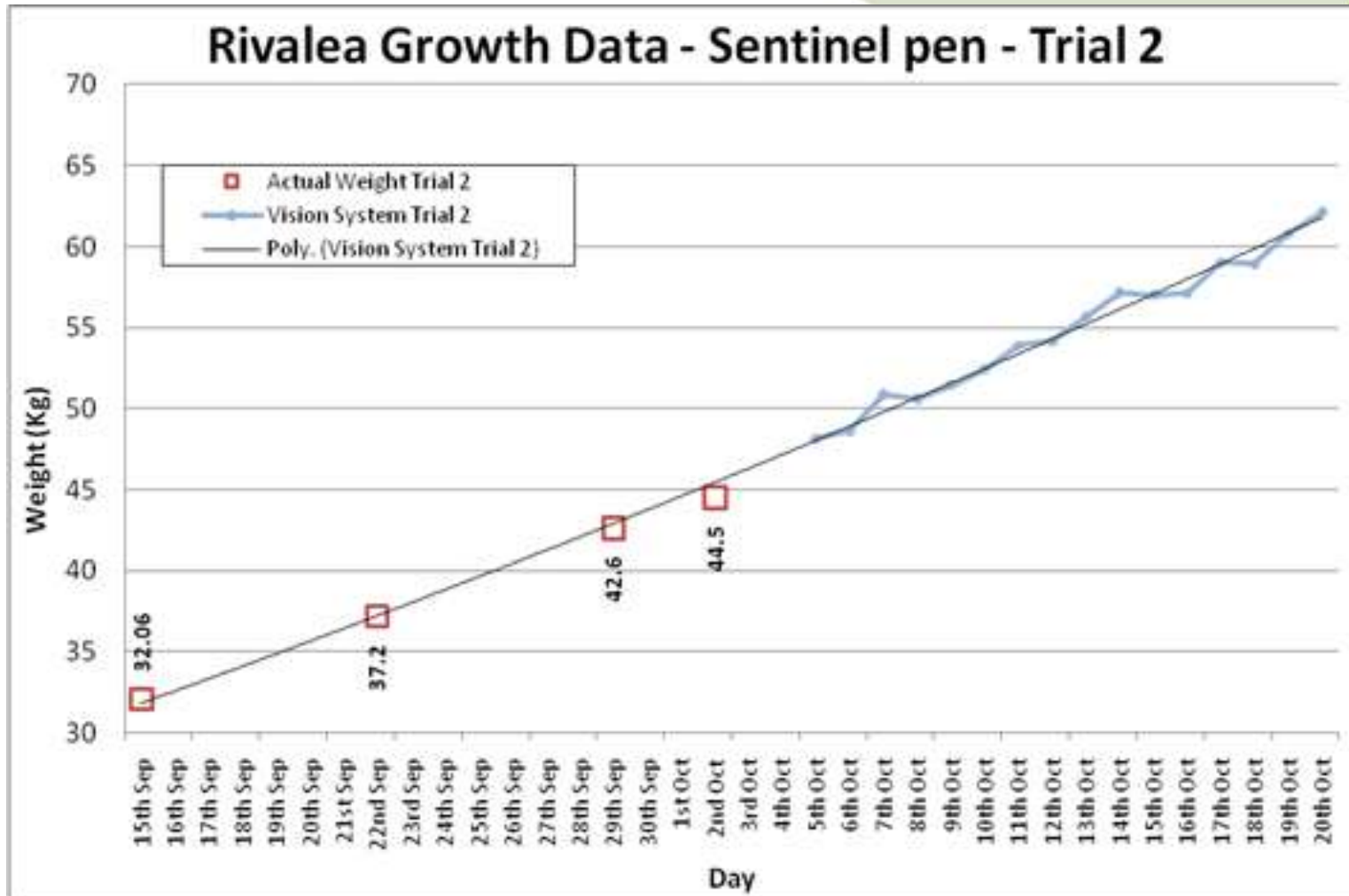


- A competing commercial system was evaluated: SE (standard error of means) 7.99 kg
- SARDI system: SE 1.2 kg

Results 2: predicted vs. measured weights



Results 3



SWOT analysis (technologies developed)



Strengths

- Unique products
- Reliability, precision, **COST**
- **NEW control capacity!**
- Companies with experience, contacts involved

Opportunities

- Potential to enhance product & conduct further 'precision tests' that can be used as marketing material
- Additional support received from other funding agencies (AusIndustry)
- o/s markets

Weaknesses

- New product (market acceptance and support structure, such as maintenance companies still need to be cultivated)

Threats

- Cost vs. Benefits (price)
- Lack of clearly demonstrated benefits of measuring these variables and using the information to better manage farms

Commercialization approach



- Patent applications have been submitted on both systems in 2009
- A new company established (PLF Agritech Pty. Ltd.) to manage manufacturing and distribution (licence was granted by the PORK CRC)
- Equipment will be sold via rural traders and specialist companies

Enhancing commercialization opportunities for PLF technologies 1



- It would be important to:
 - Demonstrate the benefits of measuring Feed Conversion Efficiency frequently by combining animal weighing and feed sensor (need to establish follow up projects)
 - Develop a highly integrated system (PLF) to create increased demand for system components (i.e. feed sensor & IA weighing system)

Enhancing commercialization opportunities 2

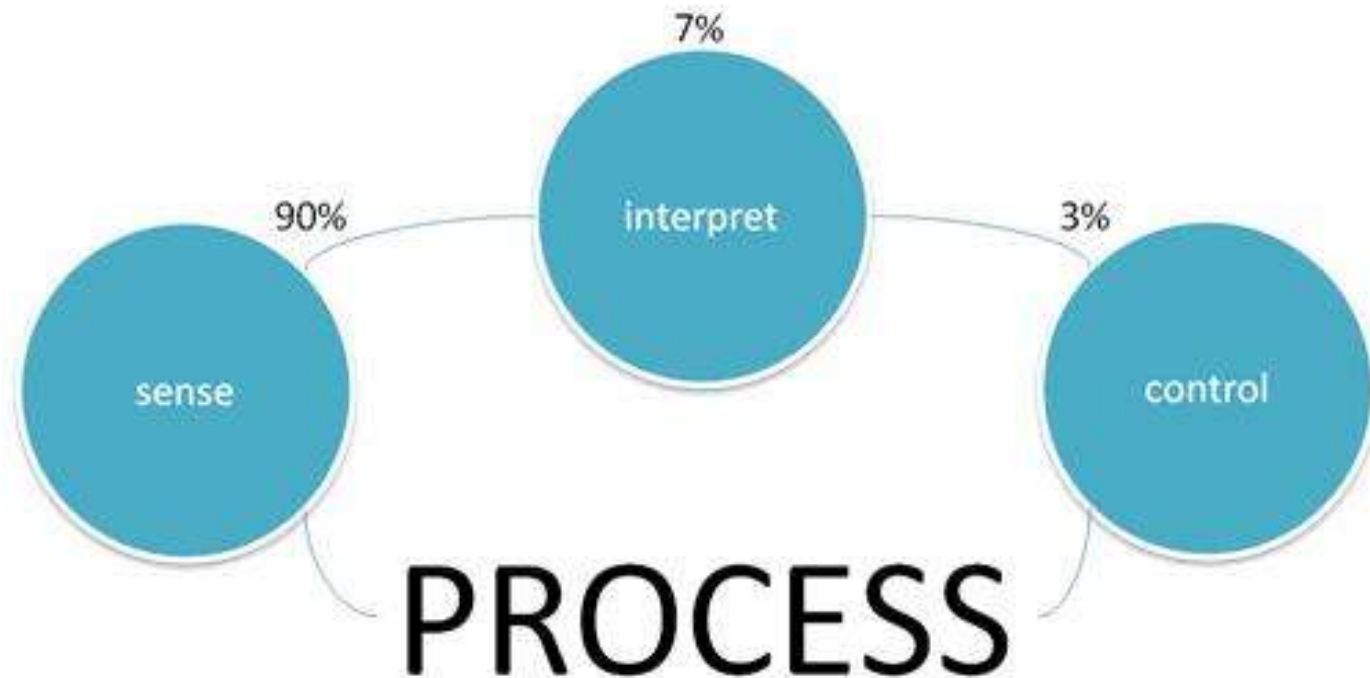


- Potential to:
- Identify animals in commercial settings with extreme FCE to facilitate improvements genetically
- Use feed-intake & weight change data to identify sick, underperforming animals
- Develop other usage of cameras installed (i.e. body composition measurement & welfare monitoring)

R&D expenditure issues



- Current problem: disproportionate R&D expenditure – not responding to the practical needs of the farming community



Importance of traceability systems



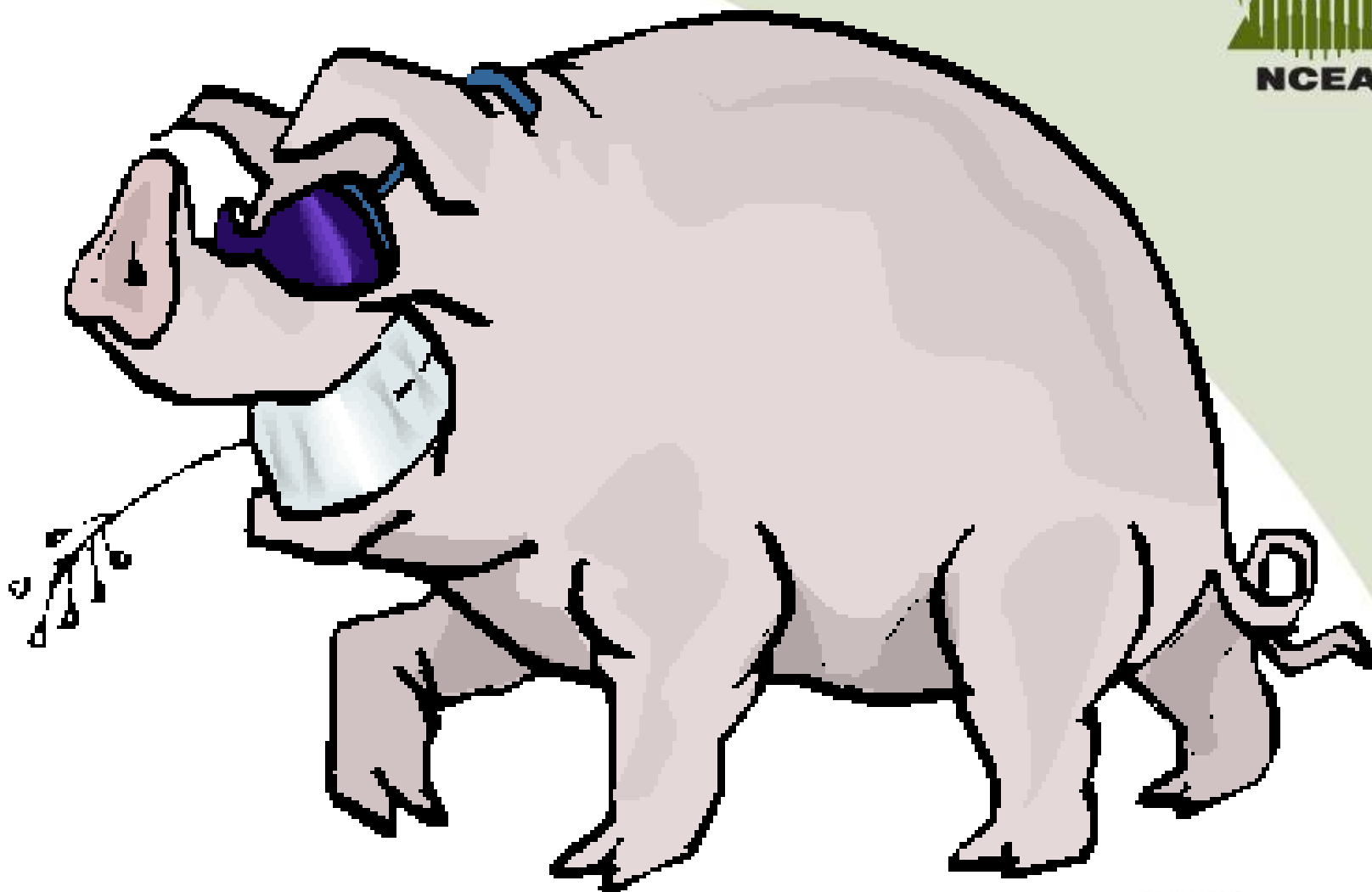
- Traceability offers an immediate benefit to producers while encouraging them to develop advanced ICT and data management systems on farms that can also be used for other PLF functions
 - The current traceability systems on pig farms in Australia are mainly a 'non-computerised' systems with little ICT technology used to automate the process, thus providing considerable room for improvements

Importance of traceability systems 2



- **Advanced traceability systems introduced on farms could provide immediate benefits and could form a solid basis for the introduction of other PLF technologies**

Thank you!



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