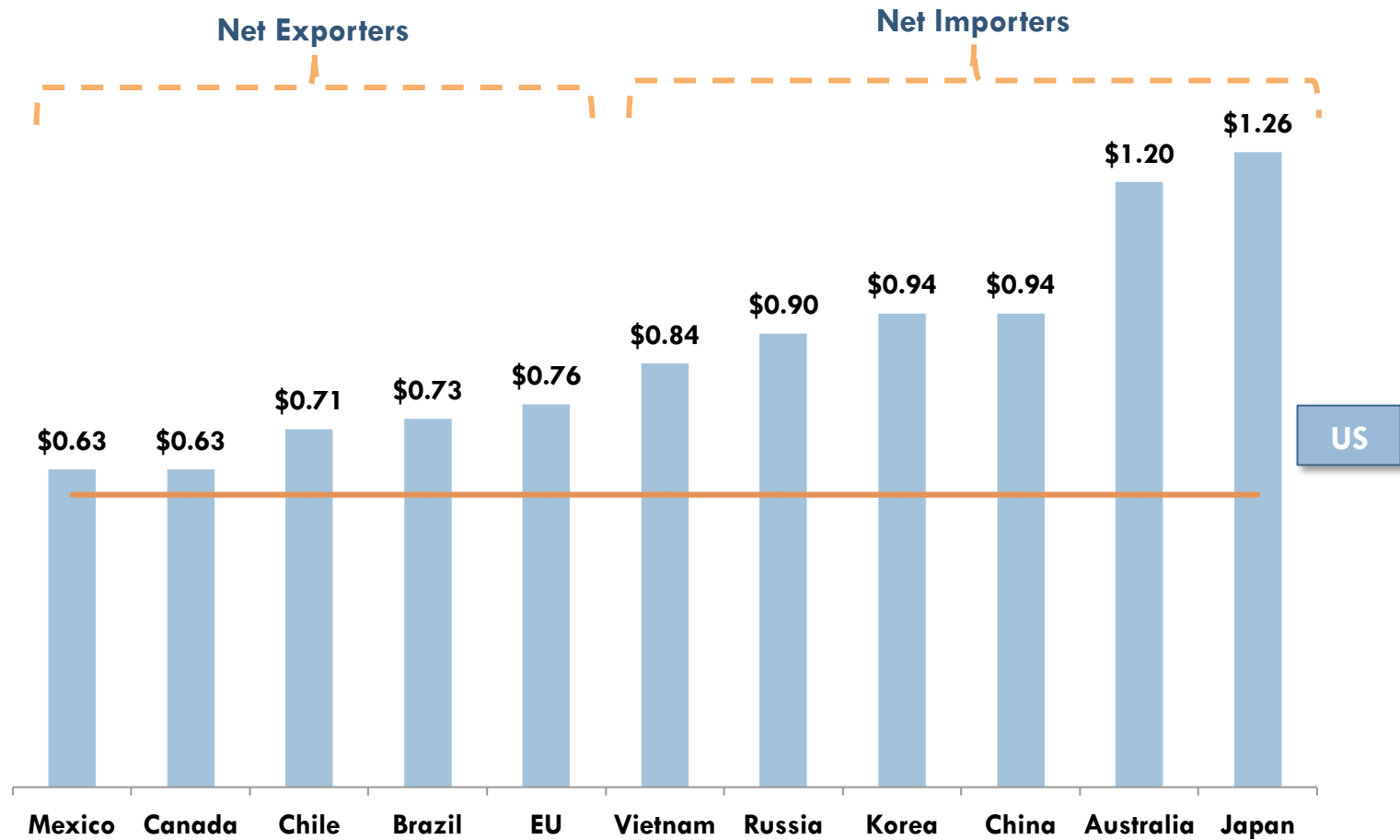


CHALLENGES AND OPPORTUNITIES

- ❑ Australian pork industry – 5 M pigs annually
- ❑ Uses 1.4-1.6 million tonne of feed annually
- ❑ 850-900 K tonne of grain (wheat, barley sorghum, triticale – other)
- ❑ Feed represents 50%-60% of cost of production
- ❑ Net importer of pork –from USA, Canada, Denmark and Netherlands

Global costs of production of pork

2013 live cost of production, USD per CWT



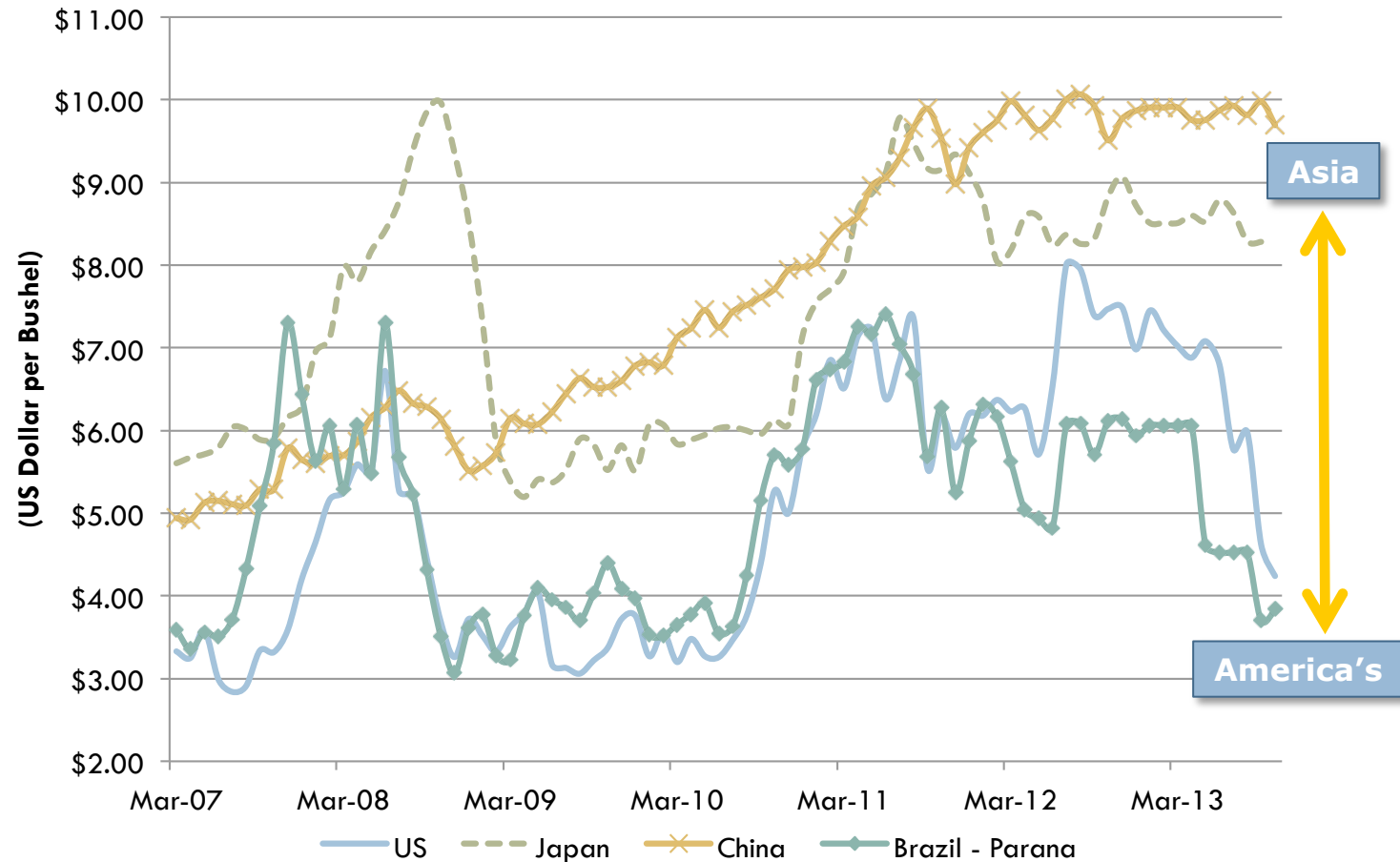
Source: Rabobank estimates, Smithfield Foods



Source -Rabo Bank 2013

Americas benefited by a Feed Grain advantage

Global Corn Prices



Source: Bloomberg



Source -Bloomberg

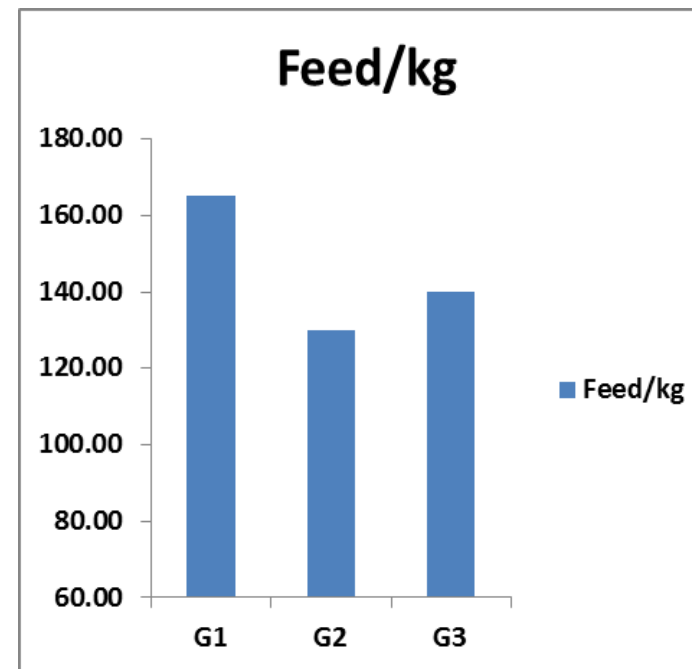
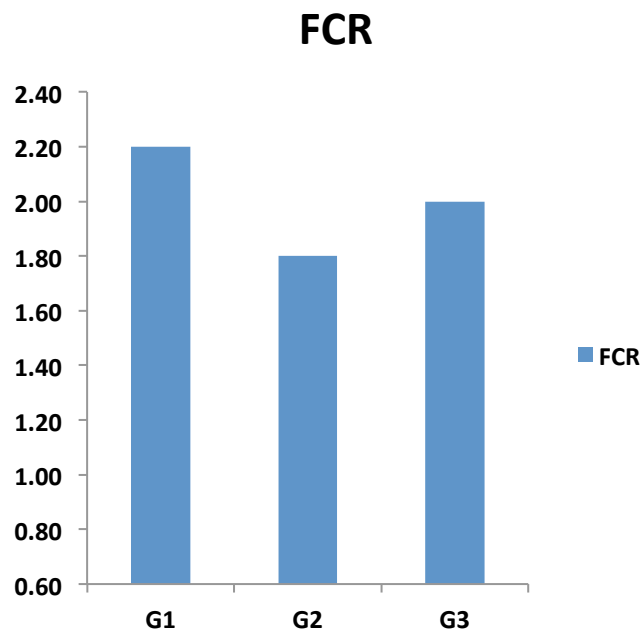
CHANGES OVER TIME

- Average feed cost in 2005-2006
 - ❖ **\$250/tonne**
- Average feed cost 2012-2013
 - ❖ **\$394/tonne**
 - ❖ Good for grain growers and challenge for animal industries

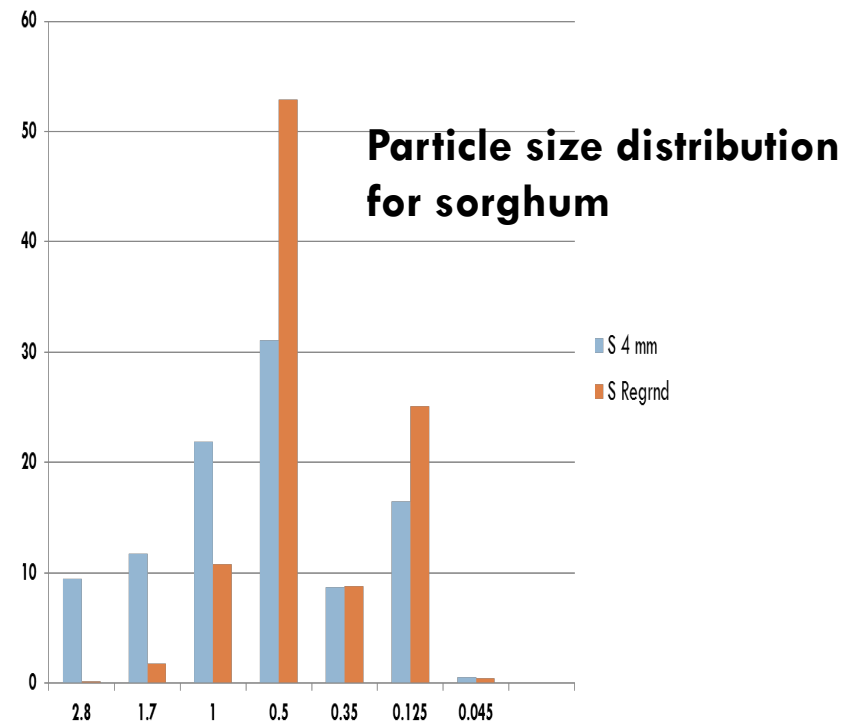
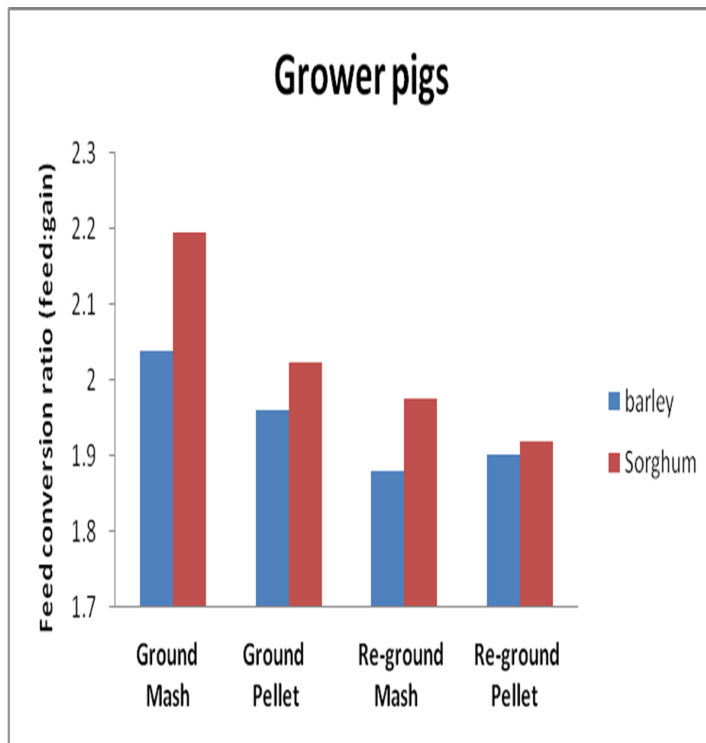
***INNOVATIONS –WHAT IS THE
INDUSTRY DOING OR DONE?***



Animals that don't require feed –the feed: gain ratio (FCR) and feed used(kg/pig) between 20 and 95 kg by three genetic lines



Grain Processing – effects of reducing the average particle size of sorghum and barley on the feed: gain of grower pigs



NIRS Calibrations for rapidly determining the energy value of grains

- GRDC initially developed calibrations for pigs, poultry and ruminants -Premium grains for livestock program.
- Commercialised and upgraded for pigs by Pork CRC and upgraded for poultry by RIRDC.
- Now very accurate and robust calibrations available.
- Knowing what you have is a good start and has contributed to improved accuracy and cost effectiveness of diet formulation.

Update on AusScan calibrations

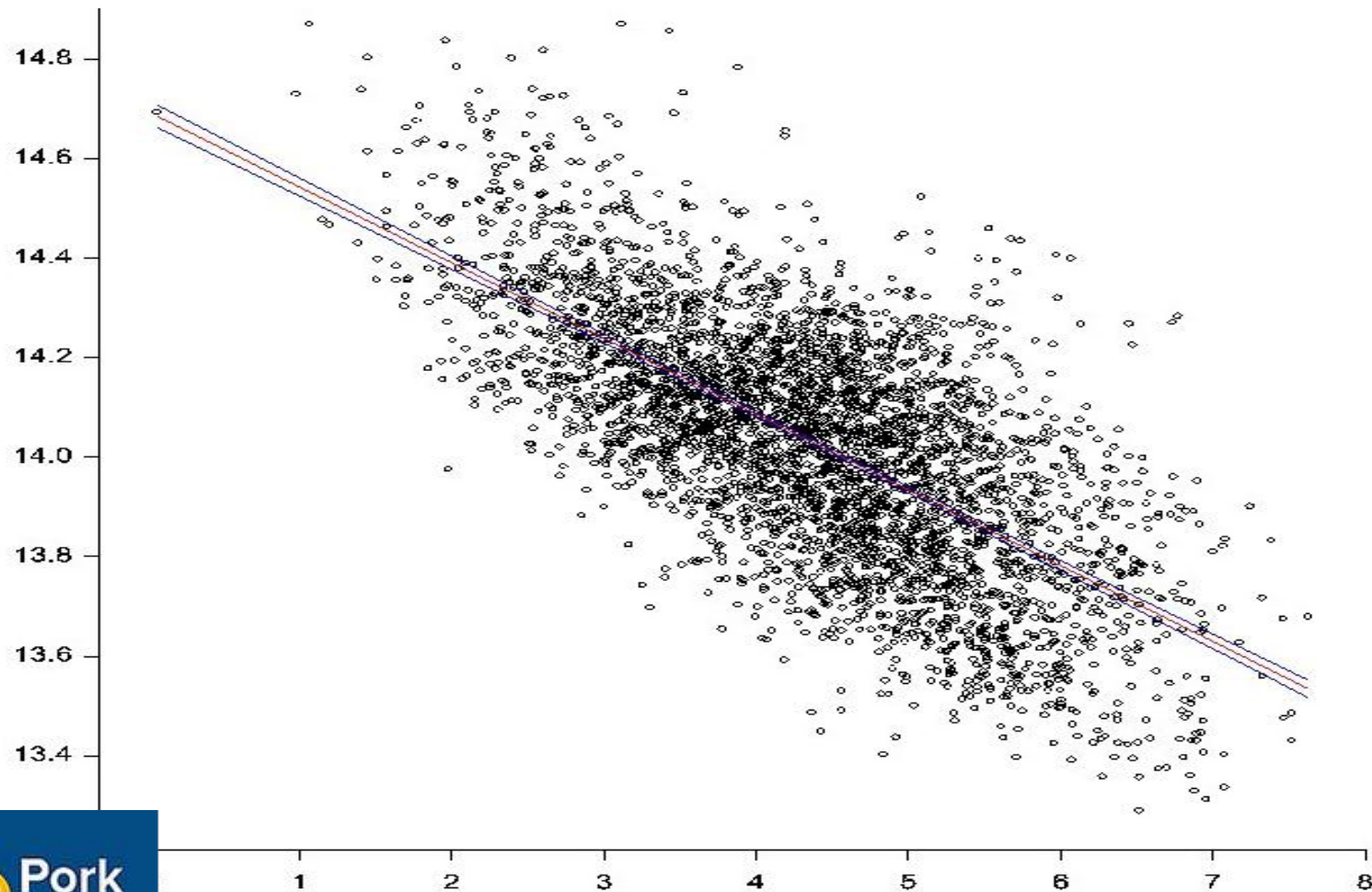
- Faecal DE –as fed
- Grain DE affected more by growing conditions/ environment than by variety

Grain	Average Faecal DE (MJ/kg)	Range
Wheat	13.8	12.7- 14.5
Barley	12.9	10.8 -13.9
Sorghum	14.4	13.4- 15.0
Triticale	13.5	12.8 -14.5
Maize	14.0	13.1 – 14.8

In the real world

- DE of wheats grown in one season – Pork CRC Intergrain project

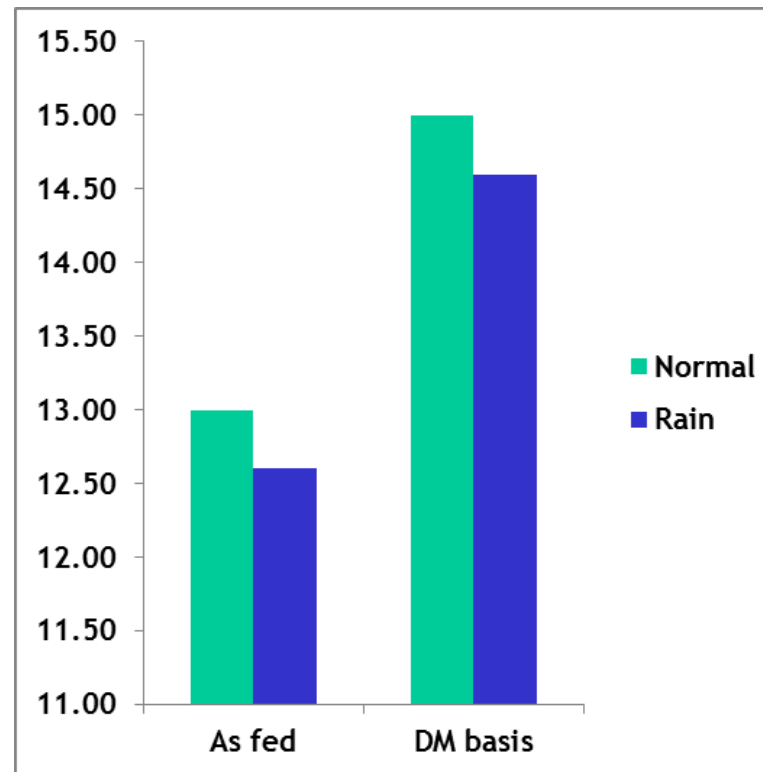
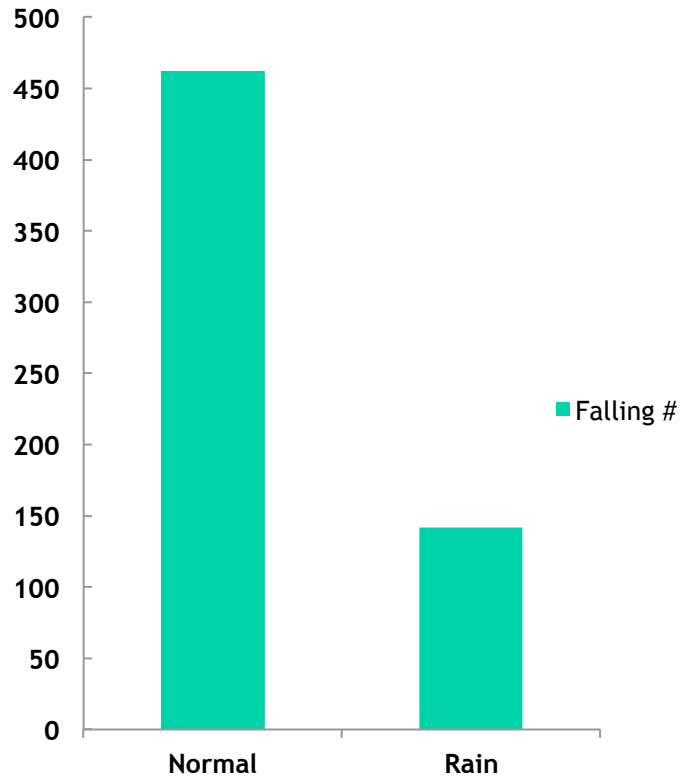
Relationship between faecal DE (MJ/kg) and arabinoxylans in wheats



HAS IMPLICATIONS FOR GRAIN GROWERS

- **Wheat graded as feed and barley that doesn't make malting – don't necessarily have lower feeding values for livestock**
- **Different grains have different feeding values for different livestock**
- **There is more value to be taken out of grains for LS industries**

Effects of natural germination (rained on) on (a) the falling number and (b) faecal DE (MJ/kg) of wheat



UPDATE

- ❑ **Calibrations soon to be available on line with immediate information on feeding value**

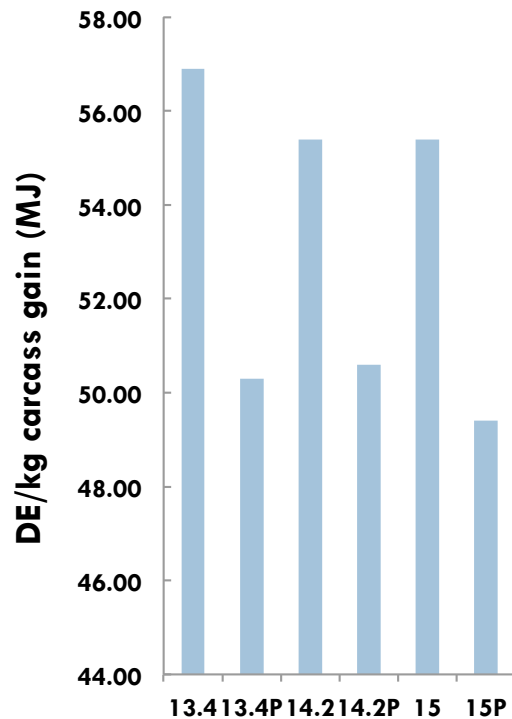
SPECIES SPECIFIC FEED GRAINS

- ❑ **Pork CRC developed one of first species specific grains**
- ❑ **Berkshire Triticale**
 - **High yielding**
 - **Higher energy**
 - **Supported excellent performance in pigs and poultry**

LESSONS LEARNED

- **Some enthusiastic growers**
- **No general interest by growers**
- **Should have developed a wheat?**
- **Animal producers – not willing to pay more**
- **Leave grain development to GRDC and grain companies?**
- **Encourage development of feed grains that benefit growers and end users**

Growth enhancers -Paylean



Energy (DE) and Paylean (P) Treatments

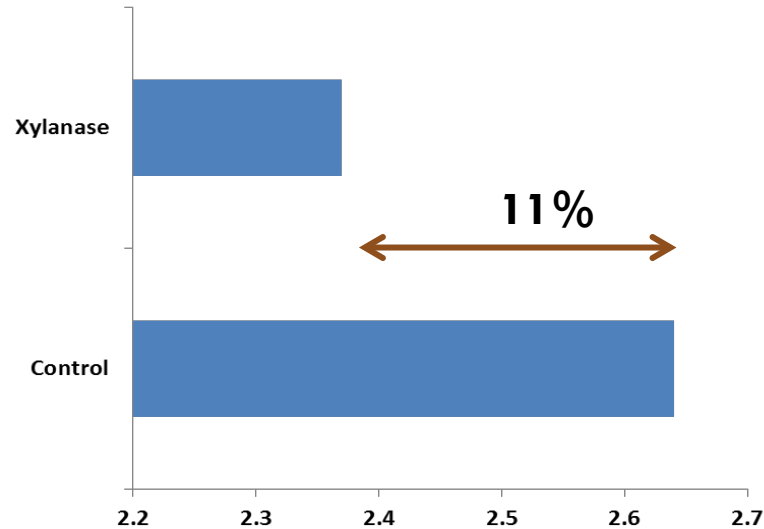
- Paylean used in last 4 weeks of growth
- Showing effects of diet DE and Paylean on energy required per unit gain in carcass weight
- 11%-12% improvement – consistent

Other – by products and co products

- Maximise use of by products and co - products
- ❖ In USA pork producers now commonly use 30%-40% by products (DDGS and wheat bran) in pig diets –replacing corn and soy bean meal

Other –exogenous enzymes

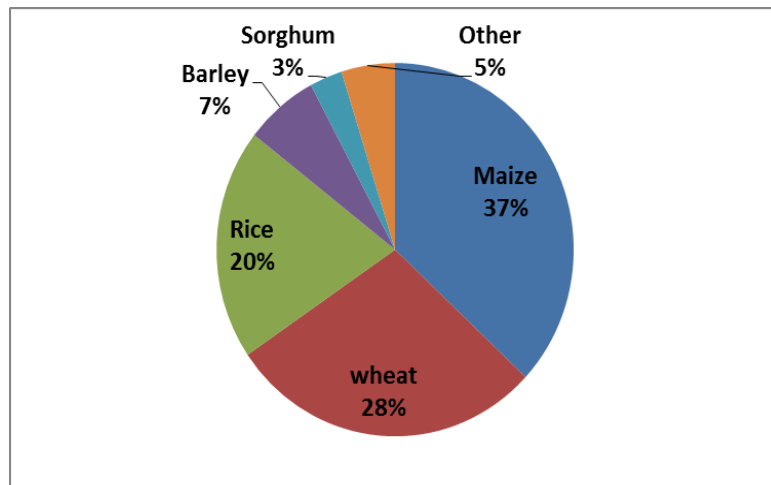
- **Exogenous enzymes** – currently more applicable to poultry than pigs but increasing responses with more fibrous diets



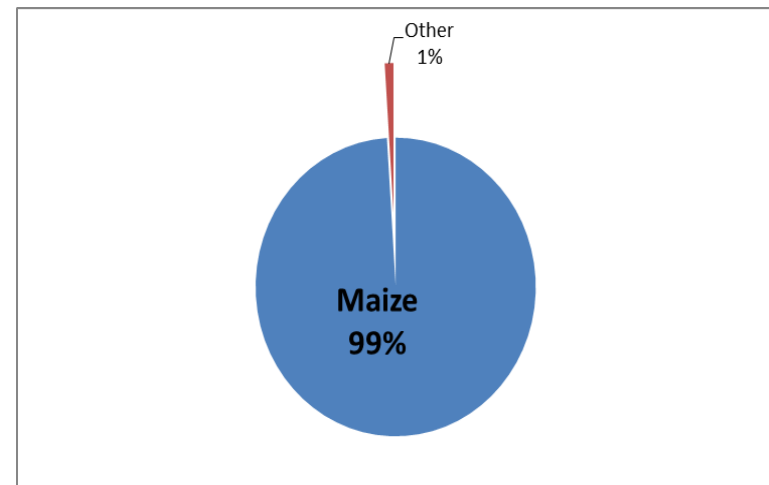
Effects of xylanase in wheat and corn based diets on the feed: gain of finisher pigs

Objectives and future directions

- Replace grains in pig diets with alternatives
- There are few alternatives – and reasons globally that growers grow – corn ,wheat, rice and a bit of barley – the dominant crops in that order



Share of grains grown globally 12-13



Feed grain production in USA

Longer Term

- **Human food waste?**
- **Algae and algae biomass??**
- **Co products from human food chain – available locally and very cost effective for producers who can access and utilise them**
- **Continued improvements in grain and nutrient yields – growers and animal industries will benefit**

