



The Australian and NZ Pork Industries – Global positions and improvements required

Putting the Pork CRC program in perspective



International Business Indicators 2006

<i>KPI</i>	<i>USA</i>	<i>Australia</i>	<i>Holland</i>	<i>Canada</i>
Pigs weaned (sow/year)	22.3	21.4	25.1	22.2
Pigs sold (Sow/year)	20.7	20.4	23.9	21.9
Carcass weight (kg)	92	75	88	90
Carcass sold (sow/year)	1905	1530	2118	1971
HFC (carcass weight)	4.03	4.05	3.56	3.84
HFC (MJ DE/kg)	59.6	54.0	50.6	49.2

*International Business Indicators 2006 –
Volume effects on HFC*

<i>KPI</i>	<i>USA</i>	<i>Australia</i>	<i>Holland</i>	<i>Canada</i>
Pigs weaned (sow/year)	22.3	21.4 (26.2)	25.1	22.2
Pigs sold (Sow/year)	20.7	20.4 (24.9)	23.9	21.9
Carcass weight (kg)	92	75 (79)	88	90
Carcass sold (sow/year)	1905	1971	2118	1971
HFC (carcass weight)	4.03	3.83	3.56	3.84
HFC (MJ DE/kg)	59.6	51.0	50.6	49.2



Effects on Profit (Price at \$2.60 (\$3.25 NZ) and Feed at \$450 (\$562 NZ))

Volume (kg/sow/year)	Margin (\$/kg carcass weight)	Profit (\$/sow/year)
1530	(0.16)	(240)
1971	0.132	251

***International Business Indicators 2008 (all
financials in \$NZ)***

<i>KPI</i>	<i>USA</i>	<i>Australia</i>	<i>Holland</i>	<i>Canada</i>	<i>NZ</i>
Pigs weaned (sow/year)	22.3	21.4	25.1	22.2	22.6
Pigs sold (Sow/year)	20.7	20.4	23.9	21.9	22
Carcass weight (kg)	92	75	88	90	68
Carcass sold (sow/year)	1905	1530	2118	1971	1496
HFC (carcass weight)	4.03	4.05	3.56	3.84	3.80 (4.2)
HFC (MJ DE/kg)	59.6	54.0	50.6	49.2	51.3 (56.7)
Feed cost (\$/tonne)	419	556	514	484	560

CRC Benchmarking KPI's (\$NZ)

TRAIT	UNITS	Average ALL Systems Jul-08	NZ Jul-08
BREEDING			
Pigs weaned /sow/year	No. pigs	21.4	22.66
No. born alive - gilts	No/litter	9.9	10.4
No. born alive - sows & gilts	No/litter	10.5	11.7
Stillbirth % litter	% of total born	7.2	8
Farrowing house mortality %	% of born alive	9.5	14
Weaning age	Days	22.6	25
No weaned/litter	No./litter	9.3	9.85
Wean to Return Interval	Days	8.4	6.8
Farrowing rate - gilts	% mated	79.1	80
Farrowing rate - gilts & sows	% mated	79.7	80
Litters/sow/year	No. of litters	2.30	2.3
Sow mortality	% of herd	13.0	8
Sow turnover rate	% of herd	70.8	35
WEANER/GROWER/FINISHER/WHOLE HERD			
Herd FCR Deadweight	Kg feed/kg dead wgt	3.95	3.80
Weaner mortality	% of inventory	1.6	1
Grower/finisher mortality	% of inventory	3	1.5
Post weaning mortality	% of inventory	4.5	2.5
Growth rate from birth	Grams/day	607.8	0.606
Growth rate from weaning	Grams/day	709	0.697
Feed use	Kg/day	1.58	1.622
Wean-finish FCR	Kg feed/kg live wgt gain	2.48	2.33
Whole herd MJ conversion efficiency (all feed: all sold)	MJ/kg deadweight	53.3	51.47
Wean to sale MJ conversion efficiency (feed & market pigs)	MJ/kg deadweight	47.05	39.56
Bacon pig sale weight	kgs/head	75.2	70
Bacon P2	mm	10.4	10.6
Bacon:pork ratio	%	97.8	92
Average weight pork & bacon pigs	kgs/head	74.9	68
Total weight sold/sow/year	kgs	1486	1502
Mated female herd size	Nos sows	78487	
FINANCIAL			
Weighted Average Feed cost	\$/Tonne	562	562
Cost per MJ of DE	\$/MJ per Kg Feed	0.042	0.042
COP (\$/kg carcass weight)	\$/kg carcass weight	3.47	?



Verifying KPIs

Canterbury - 400 sows outdoors and finishing in conventional sheds -May 2008

<i>KPI</i>	<i>Average</i>	<i>Top 10%</i>
Pigs weaned (per mated sow)	20	23.5
Pigs sold (per mated sow)	19	22.6
Carcass weight (kg)	65	70
Carcass/sow/year (kg)	1235	1582
HFC	4.21	3.88
Feed cost (\$/tonne)	571	568
COP (\$/kg)	3.69	3.27
Feed as % of COP	65.1	67.4
Overheads (\$/kg)	1.29	1.07

Waikato - 400 sows conventional - 2008

<i>KPI</i>	<i>Average</i>	<i>Top 10%</i>
Pigs weaned	21	24.5
Pigs sold	20	23.5
Carcass weight kg	65	70
Carcass/sow/year kg	1300	1645
HFC	4.05	3.75
Feed cost (\$/tonne)	556	551
COP (\$/kg)	3.57	3.17
Feed as % of COP	63.1	65.2
Overheads (\$/kg)	1.32	1.04



It's Tough Out There

- ❑ With exception of China (?) pork producers in all countries losing money.
- ❑ In USA the cost of corn has increased 170-270% since 2006 and feed by 110-120%.
- ❑ Current COP = \$1.90 (AUS) or \$2.35 NZ/kg carcass weight.
- ❑ Current Price = \$1.73 (AUS) or \$2.14 NZ/kg carcass weight. Futures suggest price to reach \$2.23 (AUS) or \$2.74 NZ in March 2009.
- ❑ Carcass weight =92 kg but declining.
- ❑ Feed costs in Europe between 80-90% higher than 2006.



So what?

- We are probably better off competitively than before.
- There is opportunity to further improve cost effectiveness and profit and potentially to grow.
- If we know what to concentrate on/change.



Secrets for success?

- ❑ Feed costs (ingredients, specifications, by products, processing, new grains, feed systems ,nutritional technologies, imported grain/ingredients)
- ❑ Feed efficiency (Genetics, metabolism modifiers, sales strategies, nutrition, volume/reproduction, wastage)
- ❑ Volume/overheads (reproduction, progeny survival and carcass weight).
- ❑ Income (price and volume).



Pork CRC Programs

□ ***Program 1- Better grains***

Targets: Reduce feed costs by 10% and increase DE of grains by 1.0 MJ.

□ ***Program 2 –Better pigs/systems***

Target: Reduce HFC to 3.6

□ ***Better Pork***

Target: Increase demand for fresh pork by 10%.



We're just not good enough?

- NZ has a good starting base
- Can't rely on price to get you through
- Good management and procurement is expected.
- NZ dollar good for exports and bad for imports –how do we exploit this?
- We need some breakthroughs and willingness to change



So what's possible?

- Feed efficiency will be key to success in longer term. Need to know your HFC.
- FE declines with age/weight and affected by sex, genotype, disease and environment.
- How can current technologies be better-more cost effectively used?
- Where to next?



Effects of Paylean and PST on progeny performance

- **Experiment compared:**
- **Control diet for last 28 days (60-100 kg)**
- **Paylean at 5 ppm for last 28 days**
- **Paylean for 28 days and PST for last 14 days**
- **Female pigs**



Performance effects

<i>Performance</i>	<i>Control</i>	<i>Paylean</i>	<i>PL and PST</i>
Daily gain (g) 0-14 (60-80 kg)	1304	1362	-----
Daily gain (g) 14-28 (80-100 kg)	908	1075	1146
Daily gain (g) 0-28	1106	1238	1235
Feed: gain 0-14	2.34	2.29	-----
Feed: gain 14-28	3.10	2.88	2.17
Feed: gain 0-28	2.61	2.50	2.31

Carcass and economic effects with feed at \$400/tonne (\$500 NZ).

<i>Performance</i>	<i>Control</i>	<i>Paylean (PL)</i>	<i>PL and PST</i>
Carcass (kg)	71.9	75.8	75.2
Carcass feed: gain	3.48	3.18	3.02
P2 (mm)	12.8	12.5	11.3
Profit change (c/kg) Auspig analysis	-----	6-8 cents	10-15 cents



*Investments with potential greatest returns –
Program 1*

- Developing feed grains specific for pigs.
- Refinement and release of NIRS calibrations for grain DE and other nutrients.
- Exploring processing technologies for enhancing the energy availability from grains.



Outcomes for Program 1

- ❑ One Barley ,two Triticale and one Pea variety will be released in 2009.
- ❑ Triticale have 10-14% yield advantages over bench mark varieties and 5-11% higher ileal DE.
- ❑ NIRS calibrations for grains should be available to industry by end of 2008.
- ❑ NIRS calibrations for available lysine in canola meal will be available late 2008.



Improving HFC – Program 2

- ❑ **Enhancing reproduction –volume (Associated in part with poor longevity)**
- ❑ **Simplifying mating –one dose AI and no heat checking.**
- ❑ **Improving the survival and performance of gilt progeny.**
- ❑ **Manipulating feed efficiency.**
- ❑ **The nutrition of the modern genotype**
- ❑ **Control of disease in older systems.**



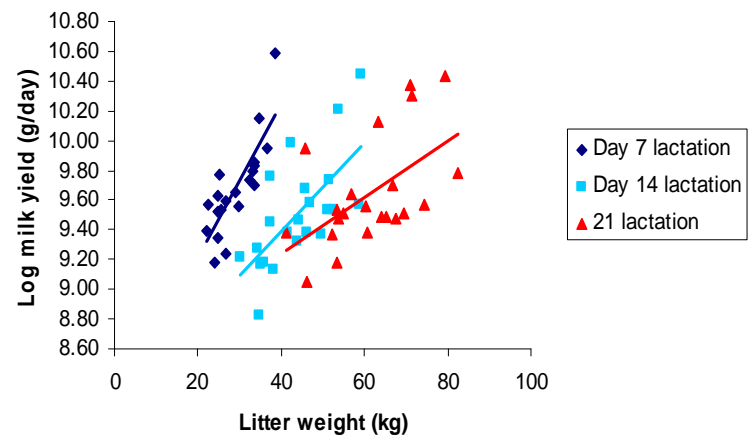
Parity: Progeny and Milk Production

- Results from study with sows and gilts using D2O to measure milk production.
- University of Sydney (Trish Holyoake and Yvette Miller)

Effects of parity on pre weaning performance of progeny

	<i>Gilt</i>		<i>Sow</i>	
	Average	SD	Average	SD
Birth	1.49	0.31	1.72	0.40
7 days	2.60	0.56	3.08	0.75
14 days	4.00	1.34	4.70	1.17
21 days	5.66	1.22	6.42	1.46
Weaning	6.86	1.42	7.23	1.45

Effects of litter weight on milk production





Milk production (kg/day)

<i>Parity/day</i>	<i>Day 7</i>	<i>Day 14</i>	<i>Day 21</i>
Gilt	14.1	12.4	13.7
Sow	19.6	16.5	19.6



Are we feeding pigs ‘Efficiently’

- Dr Ron Newman and Stuart Wilkinson investigating feeding pattern on metabolic efficiency.
- Results of experiment in which pigs offered feed ad libitum or offered the same amount of feed in three ‘meals’- Phasic feeding?



Effects of feeding “pattern” on the performance of female pigs over 49 days starting at 35 kg

<i>Treatment</i>	<i>Adlibitum</i>	<i>Phase</i>
Feed intake (kg/d)	2.69	2.49
ROG (g/d)	1051	1048
Feed: gain	2.68	2.42
Feed (kg/pig)	158	143
Carcass fat (%)	16.3	13.7
Carcass lean (%)	57.9	60.7

Diet DE and Lactating Gilts



Effects of dietary DE during lactation on the performance of gilts and their litters

- 300 lactating gilts offered 5 diets with DE contents ranging from 13 to 15.3 MJ DE/kg.
- All diets contained 0.9 gram lysine: MJ DE and were offered ad libitum as mash feed.
- Piglet performance and sow weight changes measured over 26 days
- Subsequent reproductive performance measured.
- Study conducted during summer of 06/07



Effects in lactation

Diet DE (MJ/kg)	13.0	13.6	14.2	14.7	15.3
Feed Intake (kg/d)	4.7	4.7	4.6	4.7	4.7
DE Intake MJ/d	61	64	65	69	72
Piglet growth (g/d)	201	192	209	205	209
Sow weight loss (kg)	19.0	12.5	15.3	12.4	10.2
P2 Loss (mm)	3.5	3.3	3.4	2.7	2.8

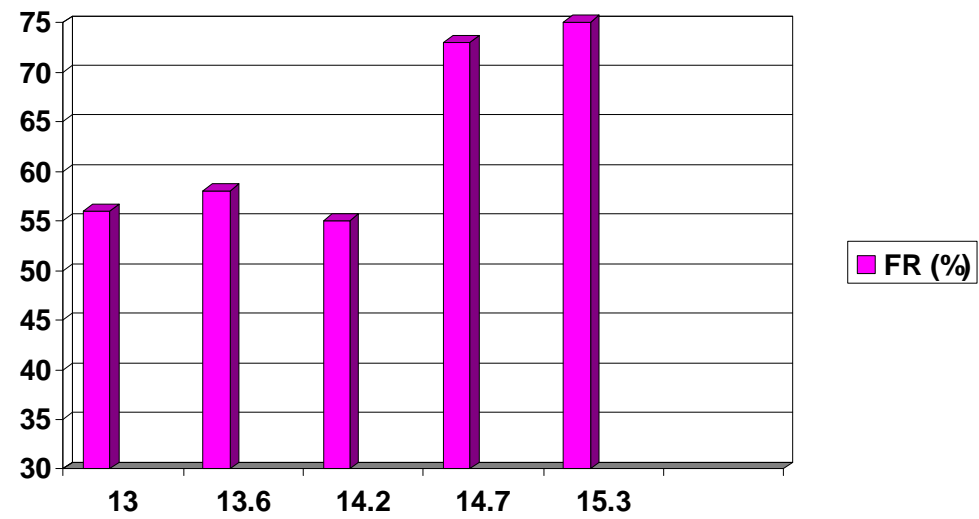


Subsequent effects

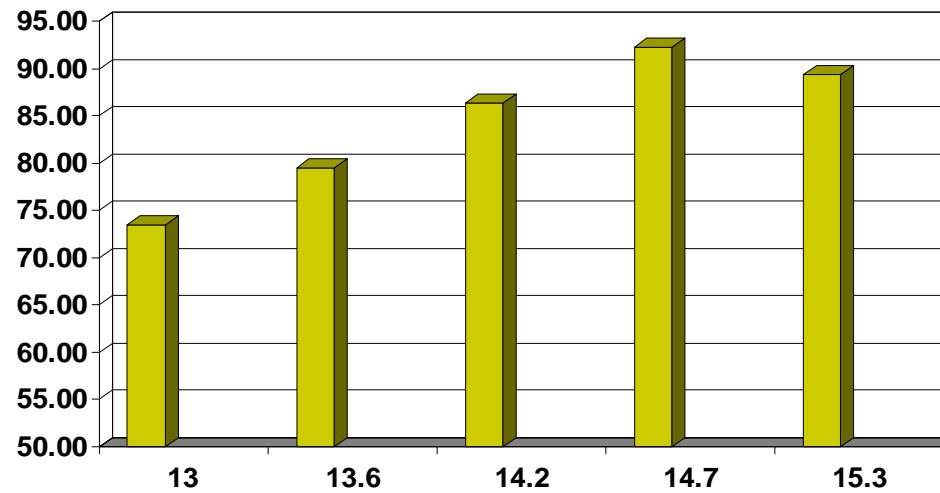
Diet DE (MJ/kg)	13.0	13.6	14.2	14.7	15.3
No mated (%)	85	76	94	90	85
Wean to remating (d)	8.2	7.0	6.3	5.7	5.9
Mated within 7 days (%)	73.5	79.5	86.3	92.2	89.4
Born alive	11.5	10.0	10.3	10.8	10.9



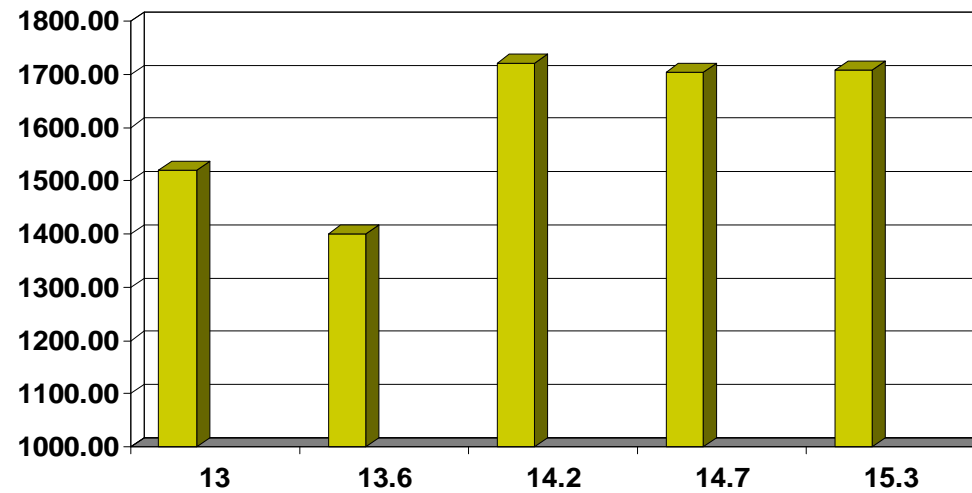
Farrowing rate(%) vs. dietary DE



*Effects on Number mated within 7 days
(%)*



*Pigs born alive over two litters per 100
gilts farrowing*

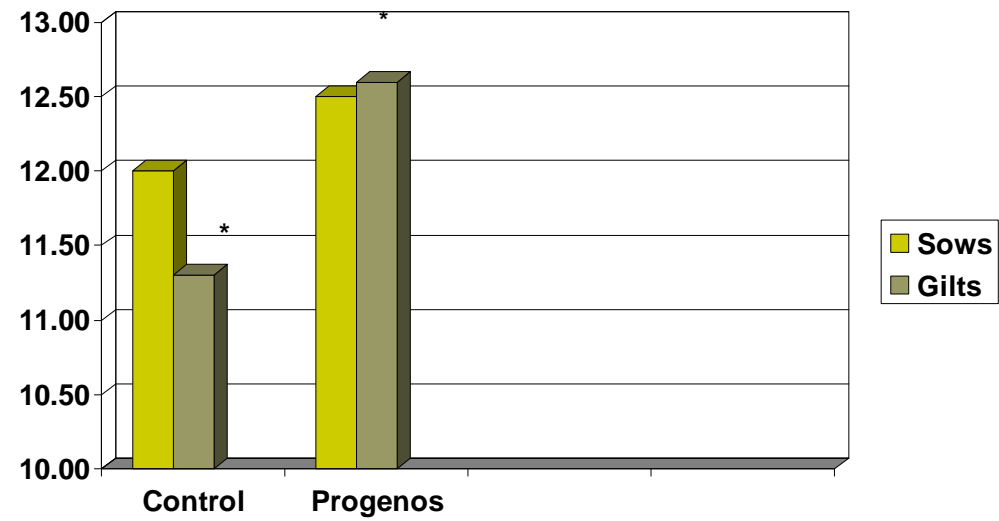




Conclusions

- Energy intake in first lactation affects sow longevity.
- Results suggest a minimal DE intake of 70 MJ/d required in first lactation to minimize gilt wastage.
- Adjust dietary DE based on gilt lactation feed intake or in reality use high energy diets (14.5-15 MJ DE/kg).
- The driver is gilt weight/protein “loss” during lactation?

Effects of Arginine (Progenos) supplementation commencing days 16 or 17 of gestation on total born in sows and gilts

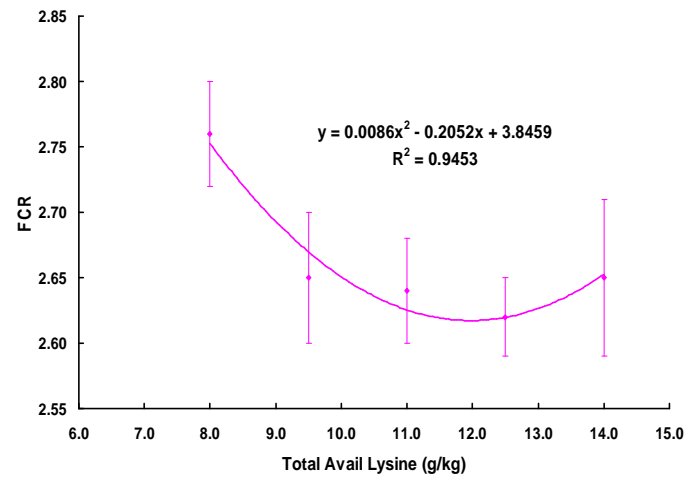




Feed Logics –responses of female pigs to available lysine between 40 and 75 kg

- PIC females in groups of 20.
- Offered feed *adlibitum* for 44 days starting at 40 kg.
- Two experiments –Exp 1 Two energy levels with wheat based diets.
- Exp -2 One energy level (13.8 MJ DE/kg) sorghum based diets.

Responses of female pigs (PIC) to dietary available lysine between 40 and 70 kg live weight (Expt 2)





Conclusions

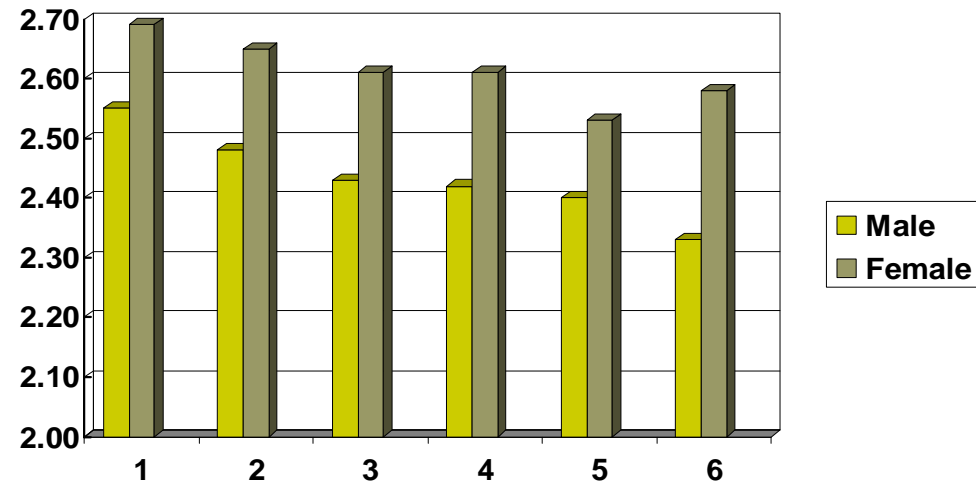
- ❑ Are current dietary recommendations appropriate for genetics available.
- ❑ Is inappropriate nutrition affecting commercial performance levels?
- ❑ Time for a change?



Latest on fat and “finishers”

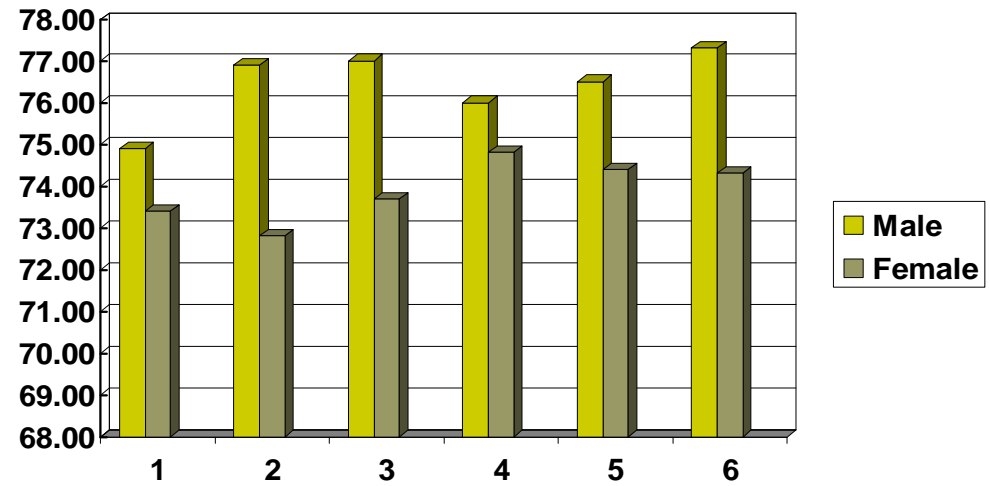
- We know that increasing DE increases the performance and carcass weight of finisher pigs –economics depends on P2 and pricing system
- Study investigated a single DE level (13.8 MJ/kg) and six levels of added fat (1%-6%).
- Male and female pigs started at 65 kg and offered feed ad libitum for 35 days.

Effects of dietary fat (%) addition on the feed: gain of pigs over 35 days starting at 65 kg.

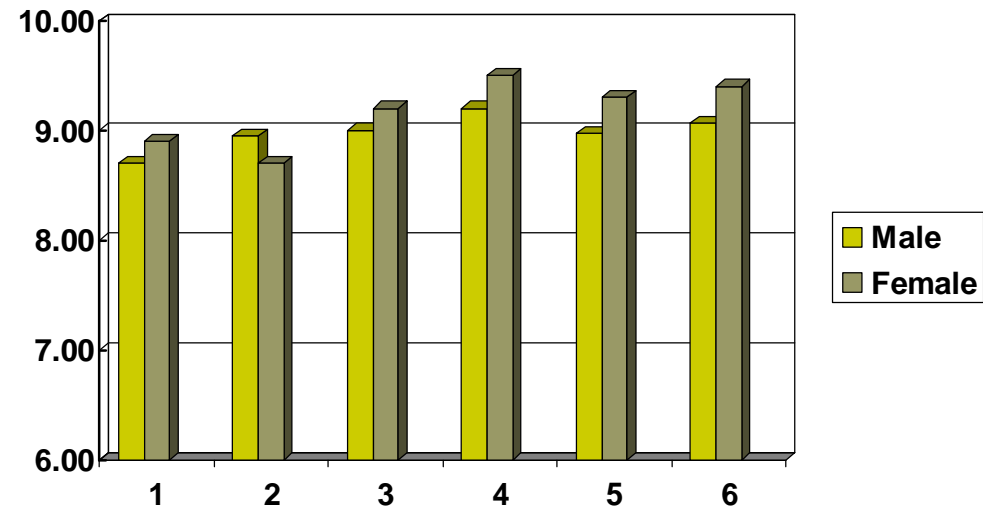


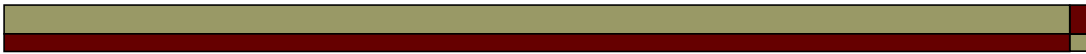


Effects of dietary fat (%) addition on carcass weight for pigs offered feed ad libitum for 35 days starting at 65 kg

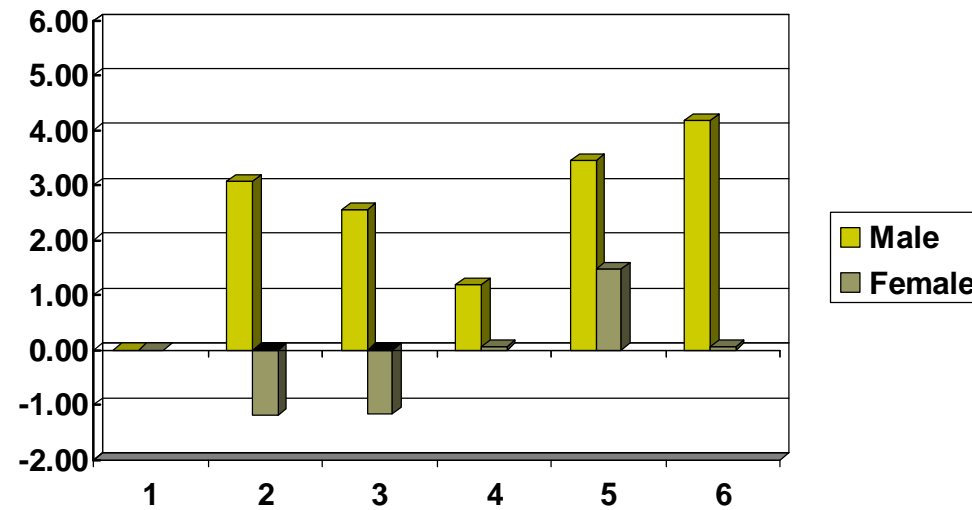


Effects of dietary fat (%) addition on carcass P2 for pigs offered feed ad libitum for 35 days starting at 65 kg (adjusted for carcass weight)





Effects of dietary fat (%) addition on profitability against diets with 1% added fat (\$/pig)





Better Pork –Program 3

Our objectives within Program 3 have changed.

- Moved from manipulating the nutrient value of pork to identifying and establishing the natural attributes of pork.**
- These include – low calorie/protein ratio and potential effects on weight loss, heart health and satiety.**
- Also effects of thiamine level on heart health and diabetes and availability of iron from pork.**
- Project on enhancing the Se content of pork and effects on colon cancer progressing well.**



Pork CRC Outcomes to date –are you aware of these?

- **High energy diets for finisher pigs. Recent evidence suggests fat per se has positive effects on FE and carcass weight.**
- **Canola Meal nutrient composition (effects on diet formulations and costs)**
- **Paylean and live weight on performance and profitability (report covers effects of dose-duration and feed costs on profit).**
- **Effects of high energy diets for lactating gilts (effects on subsequent longevity and reproduction –large economically important effects).**
- **Effects of dietary fibre on the performance and P2 of finisher pigs (Potential to reduce diets costs, F:G and P2 with no effect on carcass weight).**
- **Report on the Australian bio fuel industry and potential use of glycerol for the pork industry.**
- **Report on closed loop grain supply project with grain search.**
- **Establishment of Feed logics feeding systems for grower-finisher research in WA and Qld.**



More recent outcomes

- **Ractopamine and PST –potential to increase margin by 12+cents/kg.**
- **Lysine “requirements” of modern genetics under commercial situations-indication that may be higher than industry recommendations.**
- **Effects of lactation pressure and dietary lysine in first lactation on subsequent reproduction/longevity-first lactation crucial for long term reproductive success.**
- **Effects of feeding pattern on performance and feed efficiency-questions the metabolic efficiency of ad libitum feeding.**
- **Effects of birth weight on milk production and pre and post weaning performance –it’s the damned piglet not the dam.**
- **Effects of Progenos/Arginine in gestation on reproduction-a “simple” technology to potentially increase litter size.**
- **Potentially new APP vaccination technology-appears effective in older housing systems?**



Ranking project outcomes on immediate impact

- Paylean at 5ppm for 21-28 days – increase margin by 6-8 cents/kg.
- Paylean and PST (last 14 days)-increase margin by 12-14 cents/kg. **Not relevant to NZ.**
- Higher fat diets for finisher pigs. Potential to get further gains by combining optimum NDF and fat levels.
- High energy diets for lactating gilts- potential increase in margin and profit/sow of 13 cents and \$167 respectively.
- APP vaccination technology – 6-10 cents/kg if APP a problem (labour savings and performance/survival improvements).



What is the most effective
communication vehicle for you?

- Suggestions welcome –invited.