

**Rabbit Industry Issues – Selection, Housing, Feeding
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FRIA Field Day 25th October 2008, Kempsey
Rabbit Research supported by RIRDC

What is the goal of a breeding program?

- The main goal is to improve those traits that contribute to profit (\$/doe/year). Profit in an average rabbit enterprise is approximately \$174/doe/year. www.csiro.au/crusader
- The IMPORTANT traits (\$ from Crusader Enterprise Model):
 - Lift number weaned per litter by 1 rabbit - **\$36.56**
 - Improve growth rate by 15% - **\$13.46**
 - Reduce grower mortality by 5% - **\$14.48**
 - Reduce the inter-mating interval by 4 days - **\$29.99**
- The EASE of selection (easy to hard):
 - Growth rate – easy to measure with heritability of 0.25
 - Number weaned – relatively easy to measure but heritability is low 0.05
 - Disease resistance – difficult to measure but useful heritability at 0.1
 - Inter-mating interval – difficult in that it requires really good computerised records, low heritability.

A	B	C	D	E	F	G	H
Enter your own data in the green boxes.							
Net Income (€/year) is shown in BLUE to track impact of changes made on this page.							
Breeding Doe Costs € per Doe per Year							
Feed Costs of Doe and Litter per Year	Daily intake (kg)	No of days	Yearly feed intake (kg)	€ cost for Feed/yr	Scaling factor		
Maintenance requirement for dry does (kg/day)	0.195	365	71.18		1.30	405.89	
Extra maintenance requirement during pregnancy (kg/day)	0.052	63	3.25				
Extra maintenance requirement during lactation (kg/day)	0.065	76	4.97				
Extra maintenance requirement during pregnancy + lactation (kg/day)	0.091	153	13.92				
Extra for each gestated rabbit (kg/kit/day)	0.00325	216	7.31				
Extra doe requirement for each kitten during lactation (kg/kit/d)	0.0065		13.63				
Kitten feed intake pre-weaning (kg/kit/day)	0.03705	83	25.96				
Maintenance requirement for replacement does	0.195	103.5					
Total feed required for young replacement does			23.97				
	Total		164.19	29.55			
Feed wastage	10%		16.42	2.96		Charges aliment pa	
Key Parameters						10.27	
Gestation period (days)	31						
Interval between litters (days). Must be > 31 days	42						
Number of AI per year	8.69		89.68571429				
Pregnancy rate %	0.8						
Number of litters per year	6.95						
Age at weaning (days). MUST BE 33 days.	33						
Number of kittens born per litter	10.43						
Number of kittens born alive per litter	9.88			Net Income			
Number of kittens weaned per litter	8.4			€ 9,251.26			
Cost of feed (€/kg)	0.18		1064.528837				
Age of first mating (weeks)	19.5						
Health cost per litter (€)	0						
Semen costs per AI	1.05				0.00		
Insemination cost (€/doe/year)	9.13				9.13		
Price of day old females (€)	7.00						
Replacement cost for females	7.84				7.84		
Veterinary cost per AI (€) incl medication in feed, drugs for AI	2.7						
Veterinary costs including AI (€/doe/year)	23.46				23.46		
Direct Doe and Litter Costs per Doe per Year					€ 72.94		

The secondary goal is to reduce inbreeding

- Loss of genetic variation that results from mating closely related animals with each other, such as fathers over daughters or litter mates.
- Many important production traits, especially “fitness” traits such as litter size, are depressed by inbreeding.
- A rough rule of thumb is that for every 1% increase in inbreeding there is a corresponding 1% depression in litter size.
- An inbreeding level of 1% or less per generation is generally viewed as acceptable.
- Short generation interval, i.e. it takes 20-24 weeks to produce a doe that could potentially be mated back to the buck that sired her.
- Breeding programs are always a balance between inbreeding and genetic gain.

What is the level of inbreeding?

Number of Does	Number of Bucks	Level of Inbreeding if Breeding Unit is Closed (%/generation)
20	2	6.9
40	3	4.5
60	5	2.7
100	7	1.9
150	10	1.3
200	13	1.0
300	19	0.7

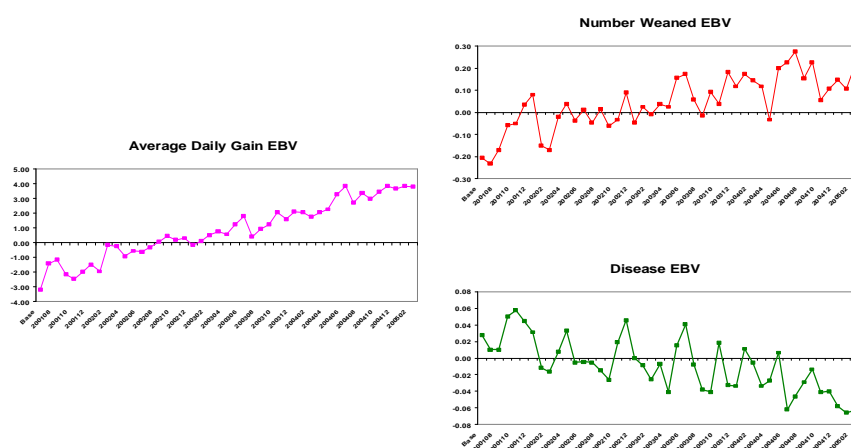
Systems to minimise inbreeding

- **2-5 Bucks and No Pedigree Recorded**
 - New/unrelated bucks purchased every 6 months
 - “Homebred” bucks should not be kept
 - Higher performing new bucks vs. cost
- **2-5 Bucks and Pedigree Recorded**
 - Set up sire families in which does are mated
 - Make sure replacement does are put into a different family
 - Buy 1-2 new/unrelated bucks every 2 years
- **>15 Bucks and Full Pedigree Recorded**
 - Use pedigree data to build a family structure (requires computing) or employ optimisation software to minimise inbreeding.

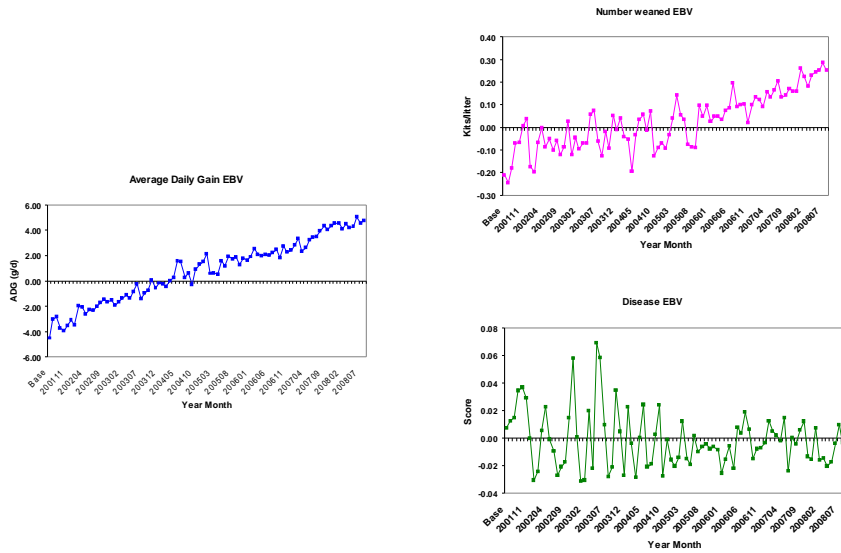
Why set up industry-based breeding programs?

- Because they are complex (EBVs), require significant resources (software and time) and are the most cost effective way of supplying genetically superior stock to industry
- Currently the meat rabbit industry has two advanced breeding program (rabbits with EBVs) – Crusader and GROWTEC
- The two programs are genetically linked (by using common bucks) and other breeding herds can link to Crusader if they are prepared to make the investment in data recording and rabbit management.
- Snowy Mountains Gourmet Rabbit Company 02 6454 4256
- www.growtec.com.au

What was happening in the Crusader breeding program in 2005?



What has happened in the Crusader breeding program since 2005?



Nest box designs evaluated at Bredbo, NSW



Crusader



Extrona



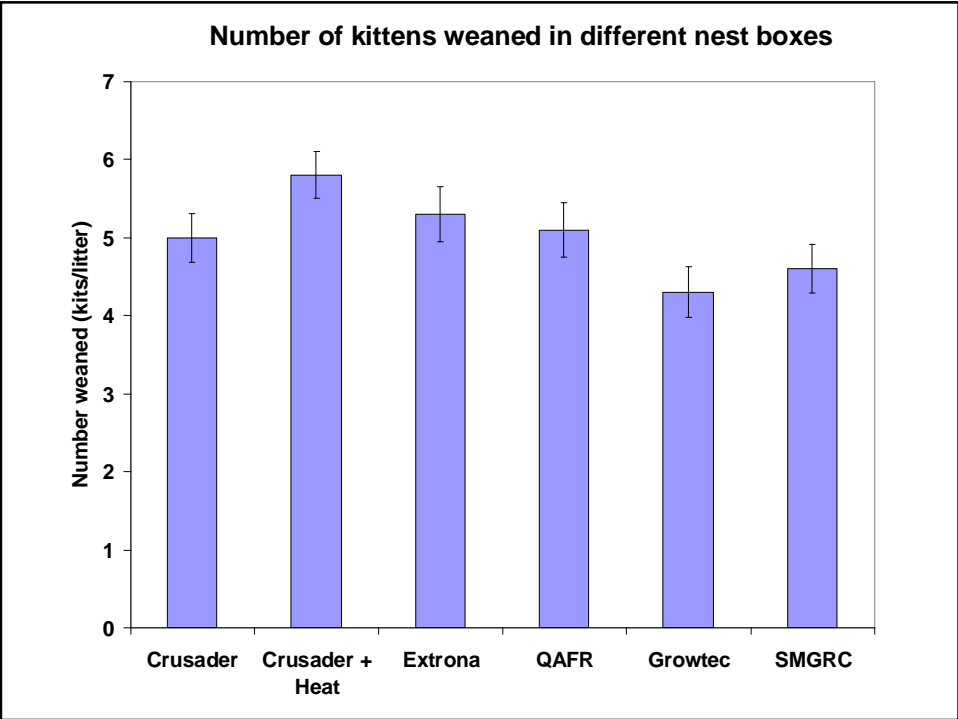
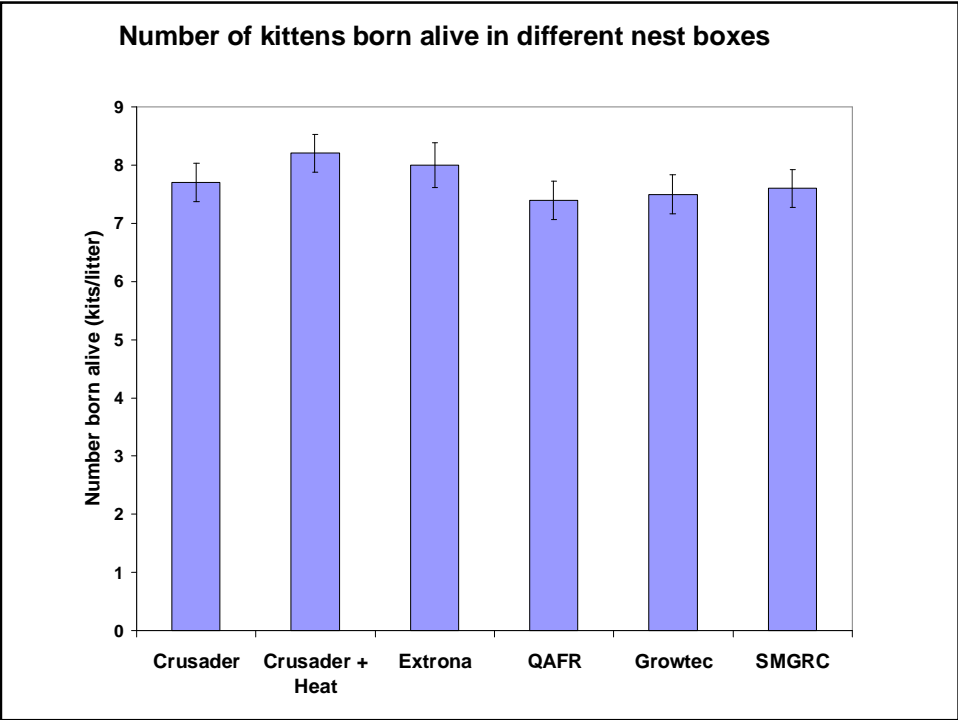
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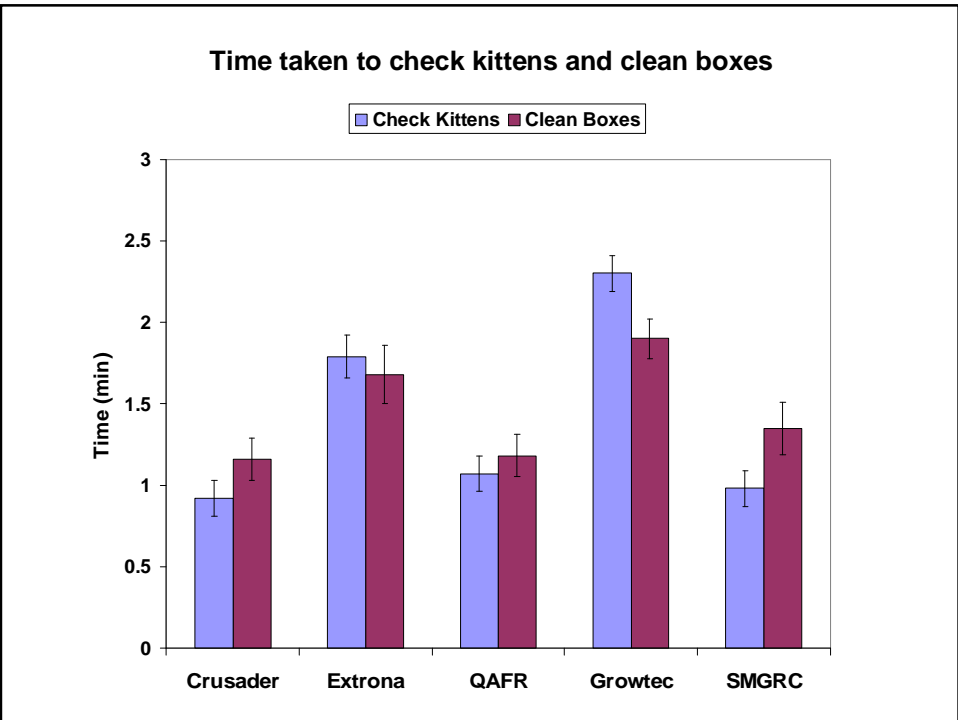
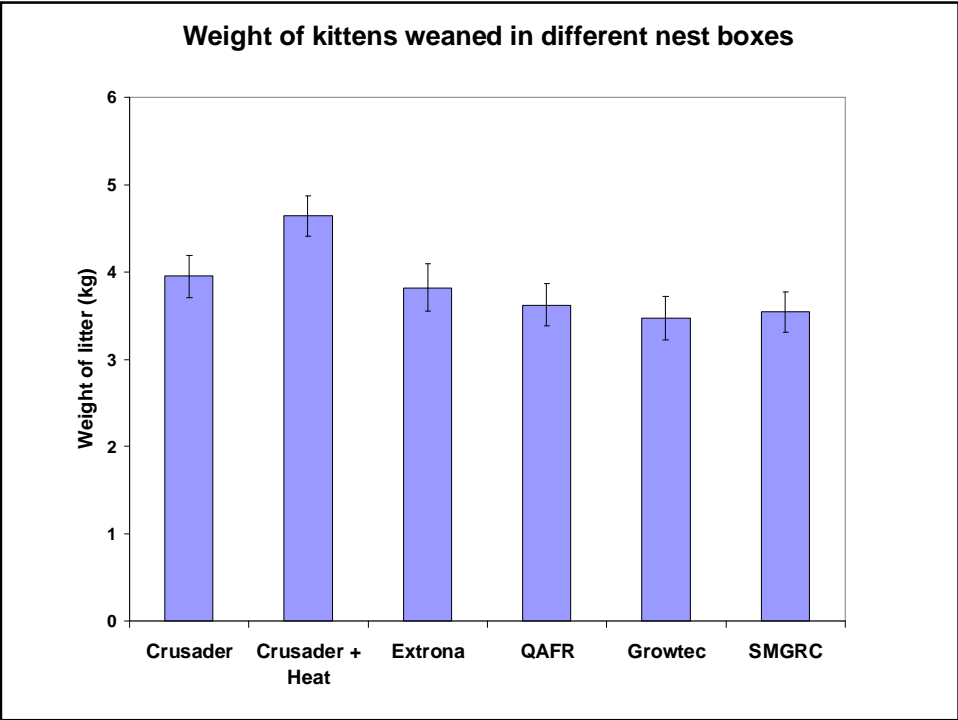


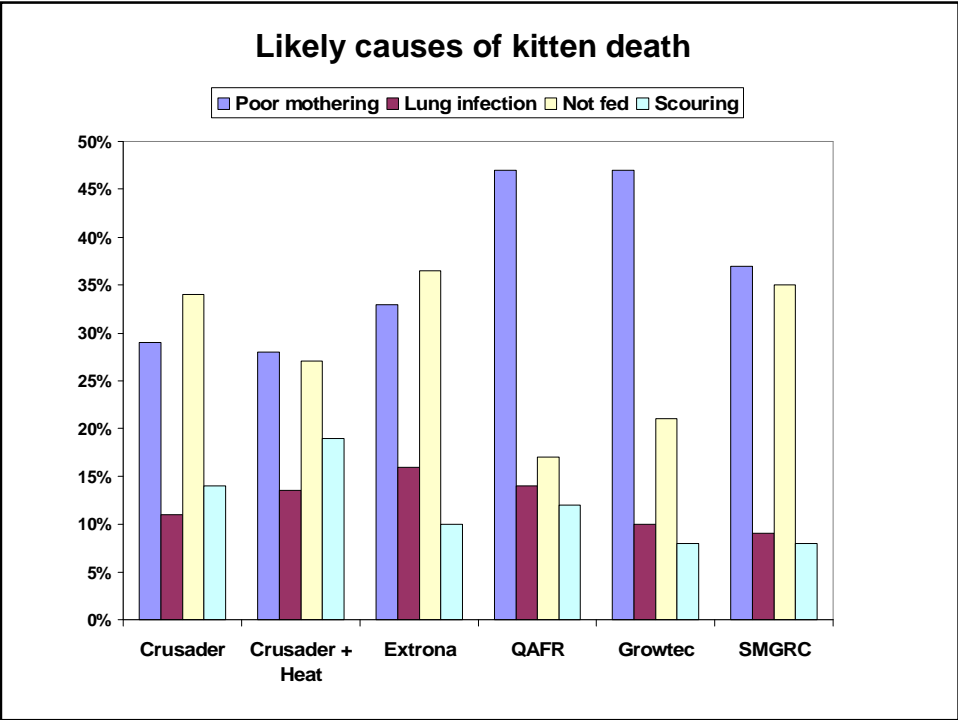
Growtec



SMGRC







Nutrition Requirements

	Maintenance	Growth	Gestation	Lactation
Digest. Energy (kcal/kg)	2200	2400	2400	2600
DE (MJ/kg)	9.20	10.0	10.0	10.9
Crude protein (%)	13	15	18	18
Crude fibre (%)	16	14	14	12
Indigestible fibre (%)	13	12	12	10
Fat (%)	3	3	3	5
Intake (g/d)	100-150	150-180	120-180	Free choice

Now revised up to 15-16%, Oct 2008

Rabbits adjust their intake to match DE 1% dical phos premix

Nutrition Delivered by Commercial Rabbit Pellets

Nutrient	Units	Laucke Feed Batch 1	Laucke Feed Batch 2 Sample 1	Laucke Feed Batch 2 Sample 2	Ambos Batch 1	Coprice Batch 1	Ridley Batch 1 Canberra	Ridley Batch 2 Armidale
Metabolisable Energy	MJ/kg DM	10.9	11.1	11.0	12.1	10.9	11.8	11.4
Crude Protein	%	22.7	22.1	21.9	20.9	18.9	21.1 21.4*	21.1*
Crude Fibre	%	13	13	13	6	16	11	11
Crude Fat	%	4.4	5.5	5.4	3.0	4.9	3.8	3.7
Neutral Detergent Fibre	%	35	35	35	18	34	30	32
Acid Detergent Fibre	%	20	19	19	8	19	13	15

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* Wet chemistry method.

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Ridley 16.5% CP and 14.5% CF; Ridley weaner 15% CP and 17% CF

Thank You



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Questions

- The questions below are some of them, and I thought I would give you forewarning.
- Hybrid Vigour – How many crosses before you lose its effect?
- EBV – What information do we need to collect to make accurate decisions?
- How can we select individuals from different litters with differing litter sizes?
- What the growth rates of the rabbit from birth to sale and if selected then onto maturity?
 - Is the growth consistent throughout life?
 - Is the growth staggered through different stages?
 - Birth to Weaning.
 - Weaning to Market (10-12 weeks)
 - Selection to Maturity
- Which traits are maternal and paternal?
- Which animals do you select to carry the right traits such as growth rates?
 - The heaviest (They might just be gutses or bullies)
 - The largest from big litters?
 - Or which one.