Maternal index review 2016

AGBU
ANIMAL GENETICS AND BREEDING UNIT
A joint unit of NSW DPI and UNE

Maternal index survey

- Aims:
  1. Collect data on commercial production systems in which maternal breeds are used
  2. Better understanding of issues related to breeding directions

- Contacted 120 current maternal LAMBPLAN members in early 2016

- 26 responses:
  - 11 Border Leicester (BL)
  - 11 Maternal Composites (CM)
  - 4 Composite “Shedders” (CS)

Survey results: commercial breeding flock

	BL	CM	CS
Fertility (conception rate) %	76	86	81
Scanning %	186	171	139
Weaning %	131	144	118
Ewes mated as yearlings (Y:N)	40:60	80:20	75:25
Mature ewe weight	67	71	65

Survey results: “straight-bred” lambs

	BL*	CM	CS
Sale age (months)	7.1	5.5	6.0
Sale weight (kg)	50.3	45.6	45.7
Carcass weight (kg)	23.2	21.1	21.7
Carcass price ($/kg)	5.4	5.2	4.8

Survey results: terminal cross lambs

	BL	CM	CS
Sale age (months)	4.4	4.3	6.0
Sale weight (kg)	41.9	46.3	50.0
Carcass weight (kg)	22.5	21.7	25.0
Carcass price ($/kg)	5.5	5.1	4.5

Survey results: wool production and price

	BL	CM	CS
Clean fleece weight (kg)	3.8	3.7	
Wool price (cents/kg)	820	570	

The importance of mature ewe size

- Increasing mature ewe weight is a concern in commercial flocks:
  - Larger ewes eat more feed and are more difficult to handle
- Has occurred often as a correlated change due to:
  - Selection to increase early growth
  - Small positive correlation with female reproduction
- Survey question:
  - *Reducing adult ewe weight is of high importance…*

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
BL	0	2	7	1	1
CM	2	5	2	2	0
CS	1	0	1	1	0

Other issues

- Use of terminal sires in self-replacing maternal flocks:
  - Increased enterprise efficiency → sire line selected for growth and carcass, maternal line selected for female traits
  - CM → majority of responses indicated 25 – 50% of commercial flock mated to terminal sires
  - CS → less important (None, or 0 – 25%)

- Importance of internal parasites:
  - CM → 60% of responses rated parasites as significant or very significant
  - Less important for BL and CS

Three new breeding objectives

BLX = Border Leicester crossing system

CMDP = Commercial Maternal Dual Purpose

CMC = Commercial Maternal Carcass

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BLX enterprise

- Border Leicester sires mated to Merino ewes:
  - Male offspring sold as lambs
  - Female offspring joined as F1 ewes
- F1 ewes mated to terminal sires:
  - First lamb at 2y.o., retained for 5 joinings
  - 120% weaning rate
  - March joining – October weaning
  - Limited feed period November to August
  - Mature ewe weight = 67kg
  - Lamb sale weight = 50kg
  - Carcass price = $5.50, and eye muscle premium of 20c/mm
  - Ewe clean fleece weight = 3.8kg, price = 800c/kg

CMDP enterprise

- Self-replacing dual purpose flock:
  - 30% of ewes mated to terminal sire
  - First lamb at 1y.o., retained for 6 joinings
  - 120% weaning rate
  - March joining – October weaning
  - Limited feed period November to August
  - Mature ewe weight = 72kg
  - Lamb sale weight = 46kg
  - Carcass price = $5.20, and eye muscle premium of 20c/mm
  - Ewe clean fleece weight = 3.7kg, price = 570c/kg
  - Reduction of WEC included in breeding objective

CMC enterprise

- Self-replacing meat flock (no wool income):
  - First lamb at 1y.o., retained for 6 joinings
  - 120% weaning rate
  - March joining – October weaning
  - Limited feed period November to August
  - Mature ewe weight = 65kg
  - Lamb sale weight = 45kg
  - Carcass price = $4.80, and eye muscle premium of 20c/mm
  - **No mating to terminal sire**
  - **WEC not included**

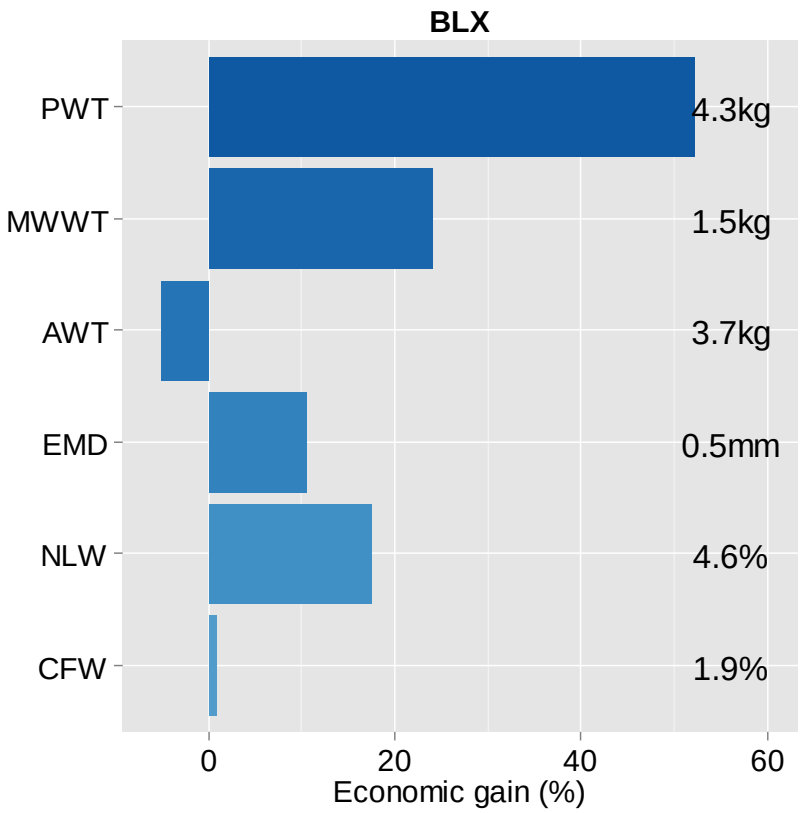
Indexes

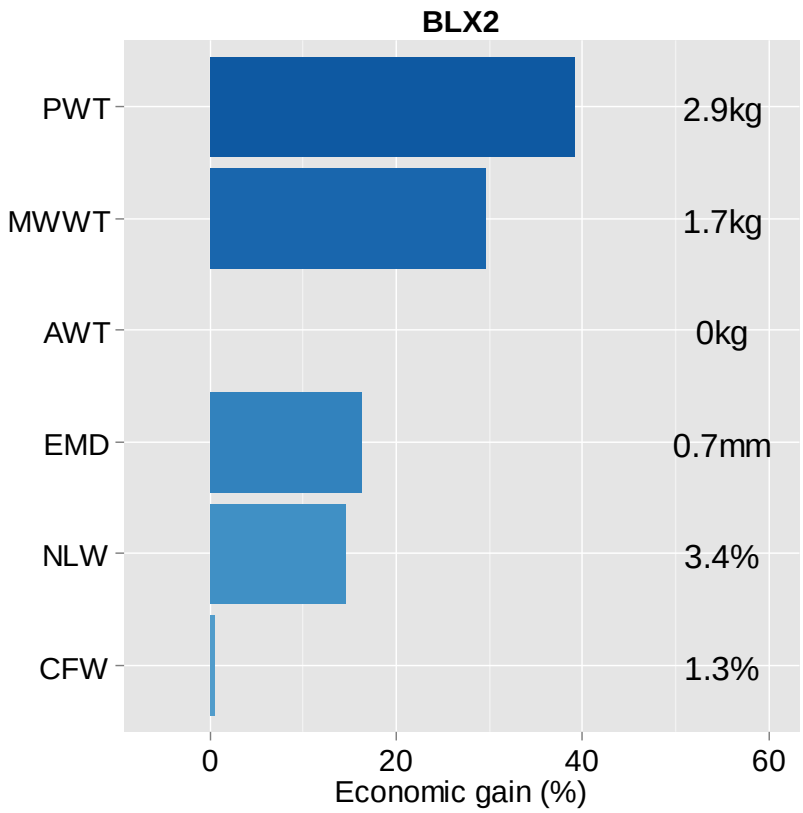
- Indexes developed for each objective:
  - BLX
  - CMDP
  - CMC

- Plus variants for each in which change in mature ewe weight has been additionally restricted:
  - BLX2 = no change in AWT
  - CMDP2 = reduction of -1kg in AWT over 10 years
  - CMC2 = no change in AWT

Need to measure AWT in breeding ewes to effect these changes

BLX trait emphasis with gains over 10 years





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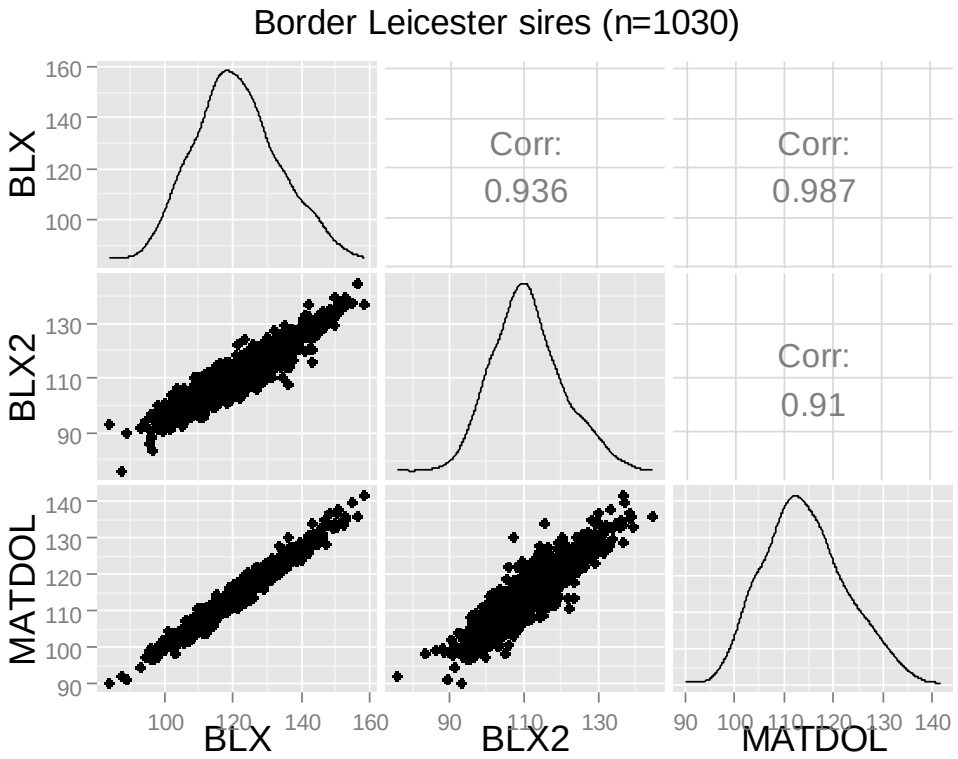
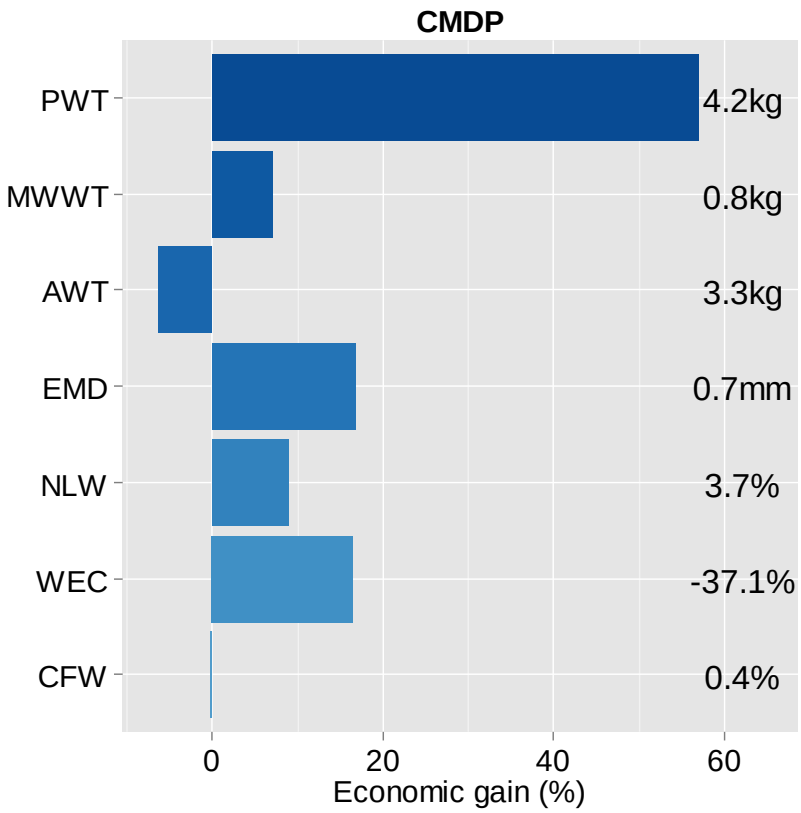
BLX indexes: sires used post-2010

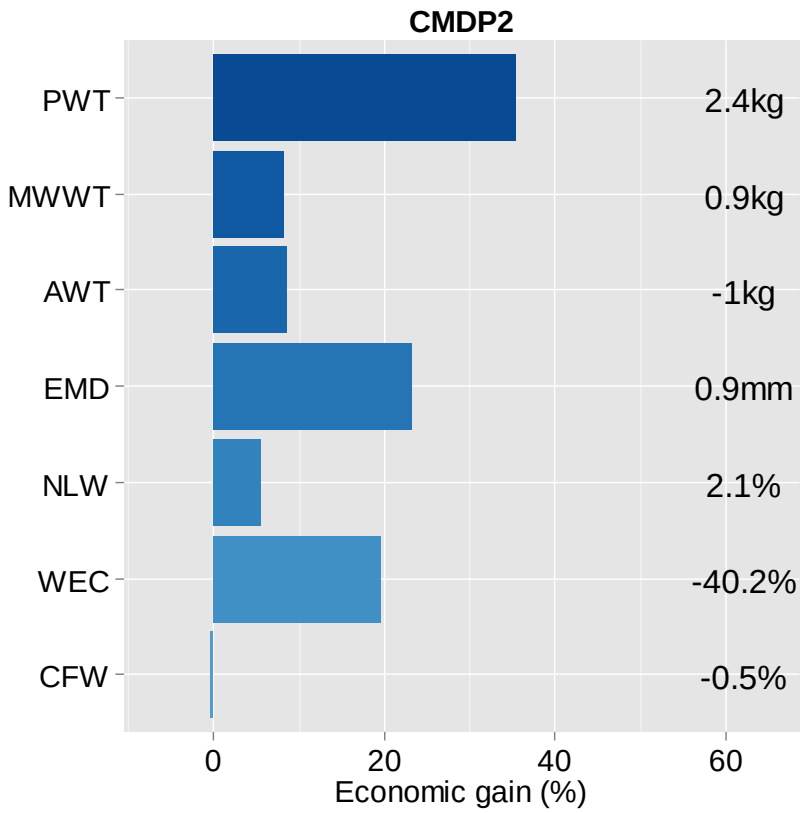


Trait means for top 10% of sires

	BWT	WWT	PWT	AWT	MWWT	PEMD	PFAT	NLW	YGFW
BLX	0.1	2.0	3.5	3.8	0.1	0.55	0.23	7	1.9
BLX2	0.1	1.4	2.8	2.2	0.3	0.61	0.28	8	1.8
MATDOL	0.1	2.0	3.5	3.9	0.0	0.51	0.25	8	1.7
Mean	**0.2**	**3.7**	**5.8**	**7.9**	**0.4**	**0.11**	**-0.22**	**4**	**4.5**

CMDP trait emphasis and 10 year gains





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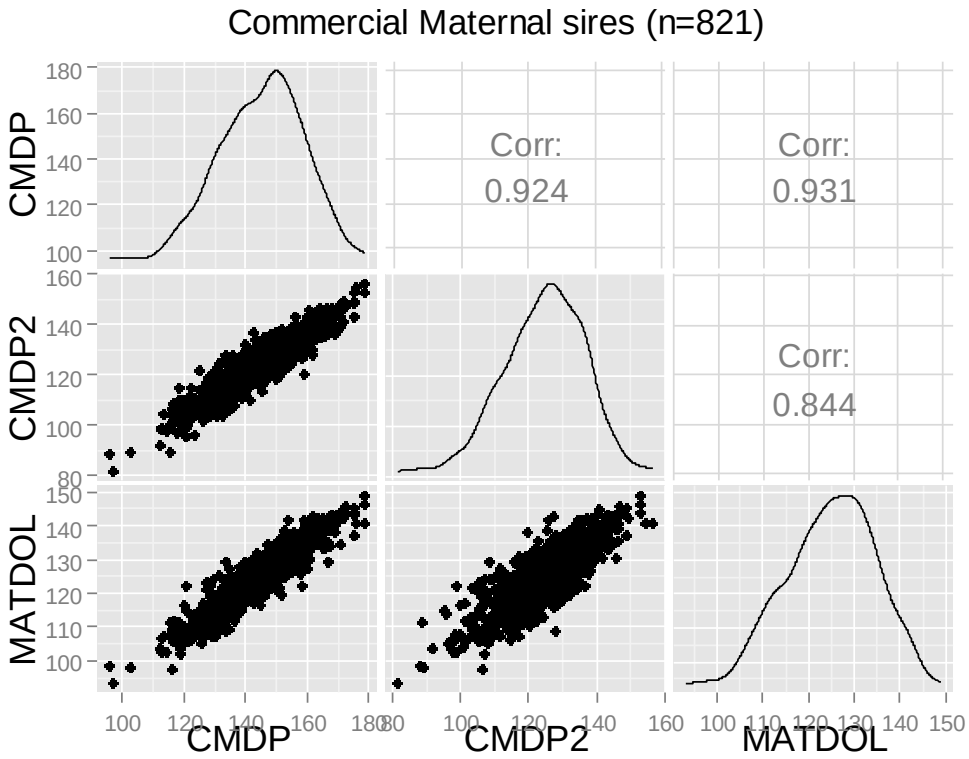
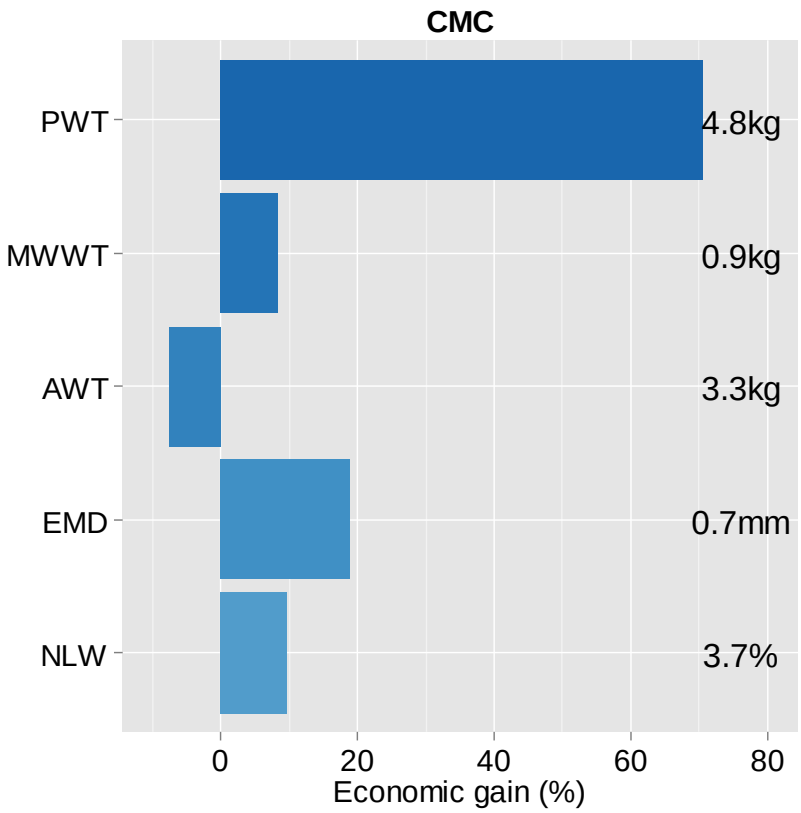
CMDP indexes: sires used post-2010

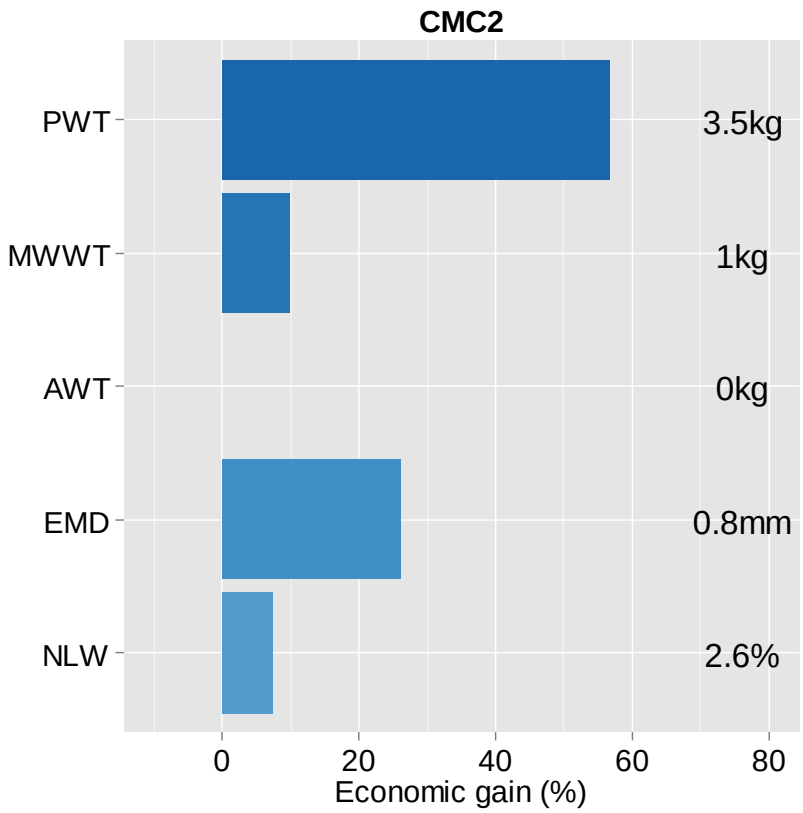


Trait means for top 10% of sires

	WWT	PWT	AWT	MWWT	PEMD	PFAT	NLW	PWEC	YGFW
CMDP	1.1	2.3	2.6	0.7	0.54	0.12	7	-25	1.8
CMDP2	0.6	1.5	1.0	0.5	0.68	0.24	7	-27	1.3
MATDOL	0.8	1.8	2.6	0.7	0.27	0.02	10	-24	2.8
Mean	**7.1**	**10.7**	**12.6**	**-0.1**	**0.83**	**-0.47**	**5**	**-13**	**3.7**

CMC trait emphasis and 10 year gains





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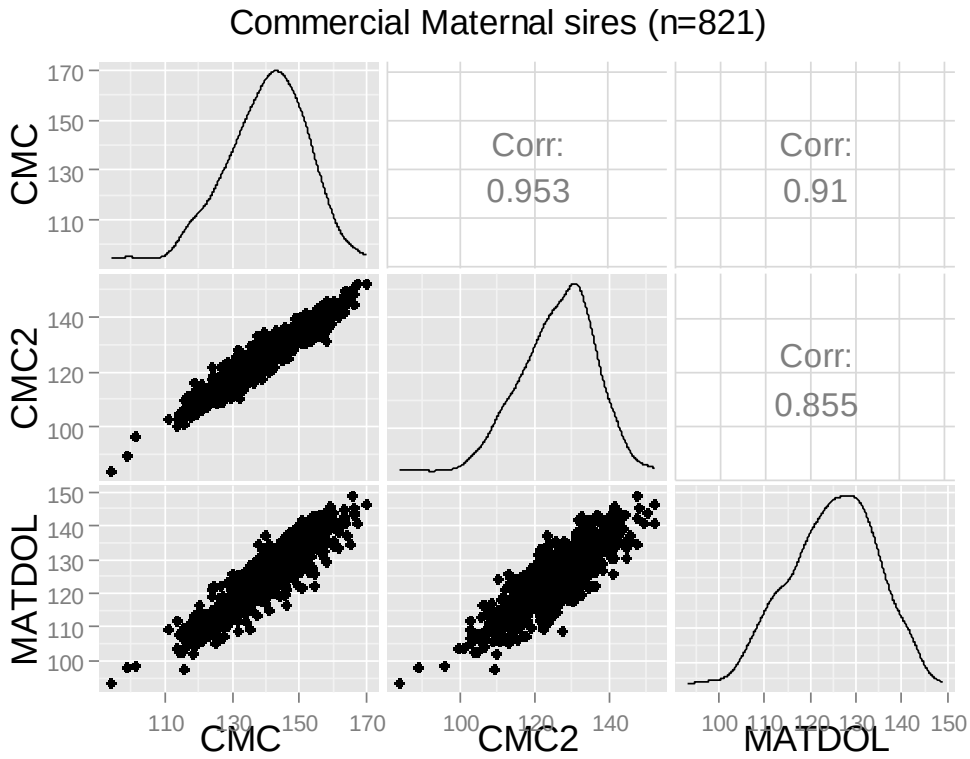

Trait means for top 10% of sires

	BWT	WWT	PWT	AWT	MWWT	PEMD	PFAT	NLW
CMC	0.1	1.3	2.5	2.8	0.8	0.57	0.12	6
CMC2	0.0	0.9	1.9	1.4	0.7	0.74	0.26	6
MATDOL	0.0	0.8	1.8	2.6	0.7	0.27	0.02	10
Mean	**0.5**	**7.1**	**10.7**	**12.6**	**-0.1**	**0.83**	**-0.47**	**5**

Summary

- New indexes based on breeder data for commercial production
- Not hugely different to current indexes
- But, restricting change in mature ewe weight causes larger differences
- Future strategy for maternal index implementation:
  - Production system based breeding objectives (BLX, CMDP, CMC)
  - Design indexes to meet these objectives
  - Indexes can change according to needs and new information