Fertility – what problem?

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Fertility for Expansion
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We are in Crisis!

- The number of female dairy calves born in 2006 will not be sufficient to maintain the national dairy herd in 2008
- Only ~35% of replacement heifers entering the dairy herd in 2008 will be from AI sires
- Mean calving date in Irish spring calving herds has slipped by ~2 days per year over the last 6-years
- Present calving pattern is reducing farm profitability
- The availability of dairy replacements will initially limit expansion in a post quota scenario

Background-Reproductive Performance

No Cows	Calv rate 1st service	Infertile rate %	Source
3706	60	<10	Crowley et al. (1967)
5660	64	5	White and O'Farrell (1972)
6318	66	<5	Roche et al. (1972)
2355	69	<4	Cunningham et al. (1978)
4542	60	<2	Cunningham and O'Byrne (1980)
13000	44	14	Farm Fetility Study (1999, 2000)

Fertility Performance on Irish Dairy Farms

Year	Yield (kg)	CALV1 (%)	Replac. (%)	NS	LN
1990		55.2	15	1.54	4.3
1991			19	1.65	4.6
1992	4992		21	1.63	4.3
1993	5307		19	1.67	4.0
1994	5383	48.3	23	1.77	4.0
1995	5490	49.4		1.66	3.9
1996	5594	44.4		1.70	3.7
1997	5629	48.7	25		.5
1998	5504	49.9	27		.4
1999	5605	46.2	26	1.87	3.5
2000	5609	42.8	27	1.89	
2001	5775	44.0	30	1.75	

+69kg/year (p<0.001)

-0.96%/year (p < 0.001)

0.9%/year (p<0.001)

+0.022 services/year (p<0.005)

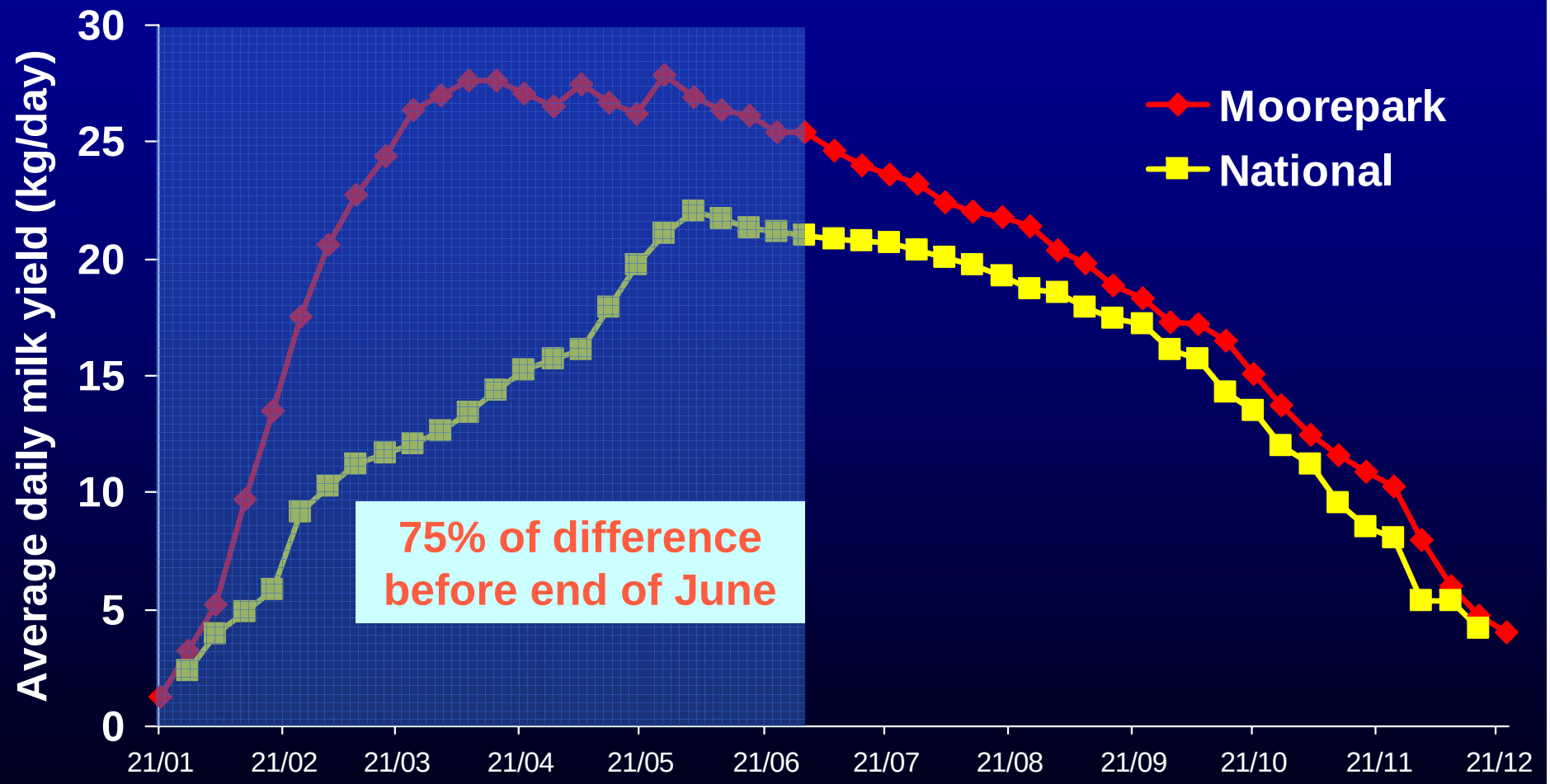
-0.1lactations/year (p<0.001)

Evans et al.,2004

Trends in the Mean Calving Date and proportion of cows calving in each month on Irish Spring-calving Dairy herds (2002-2006)

Calving month	2002	2004	2006
January	0.10	0.11	0.10
February	0.37	0.29	0.28
March	0.30	0.28	0.29
April	0.13	0.19	0.19
May	0.07	0.11	0.10
June	0.03	0.03	0.05
Mean Calving Date	08-Mar	14-Mar	16-Mar

Lactation Profile for Moorepark and National Spring Milk Production 2006



Mean Calving Date & Rate

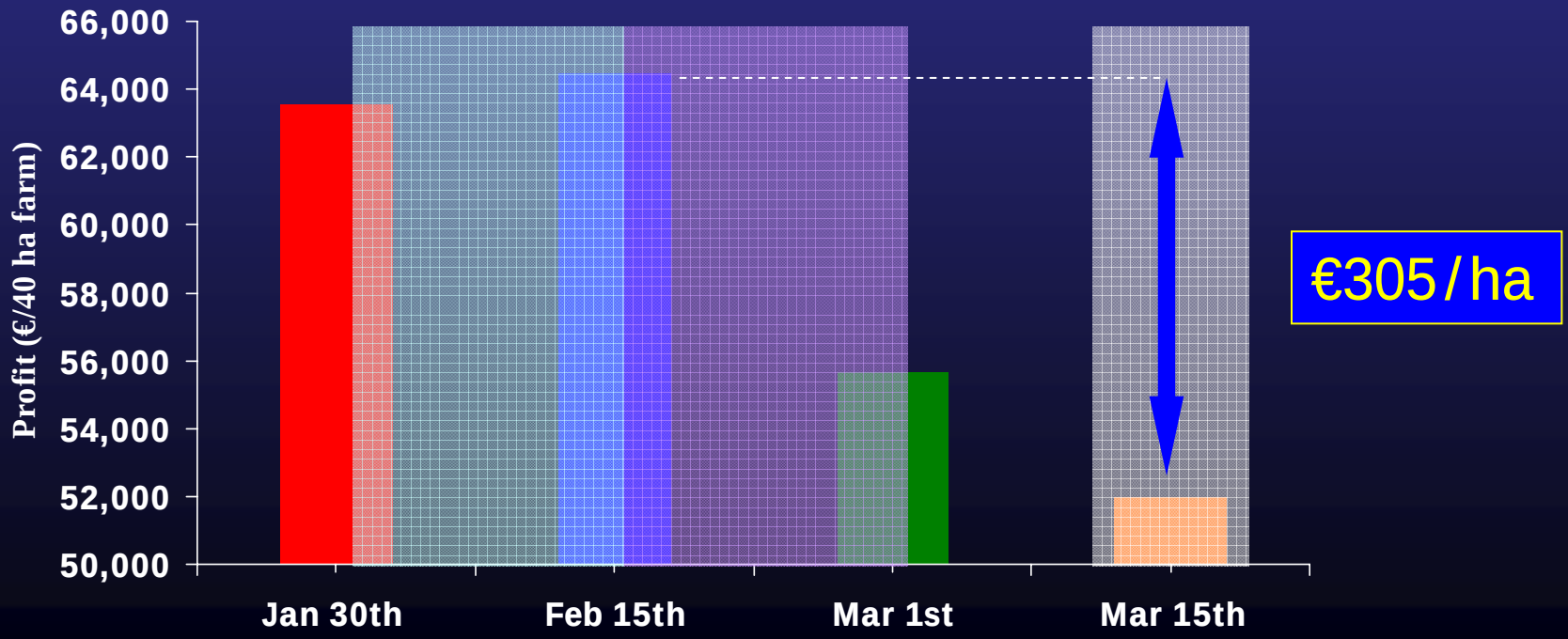
- Earlier calving

Milk production

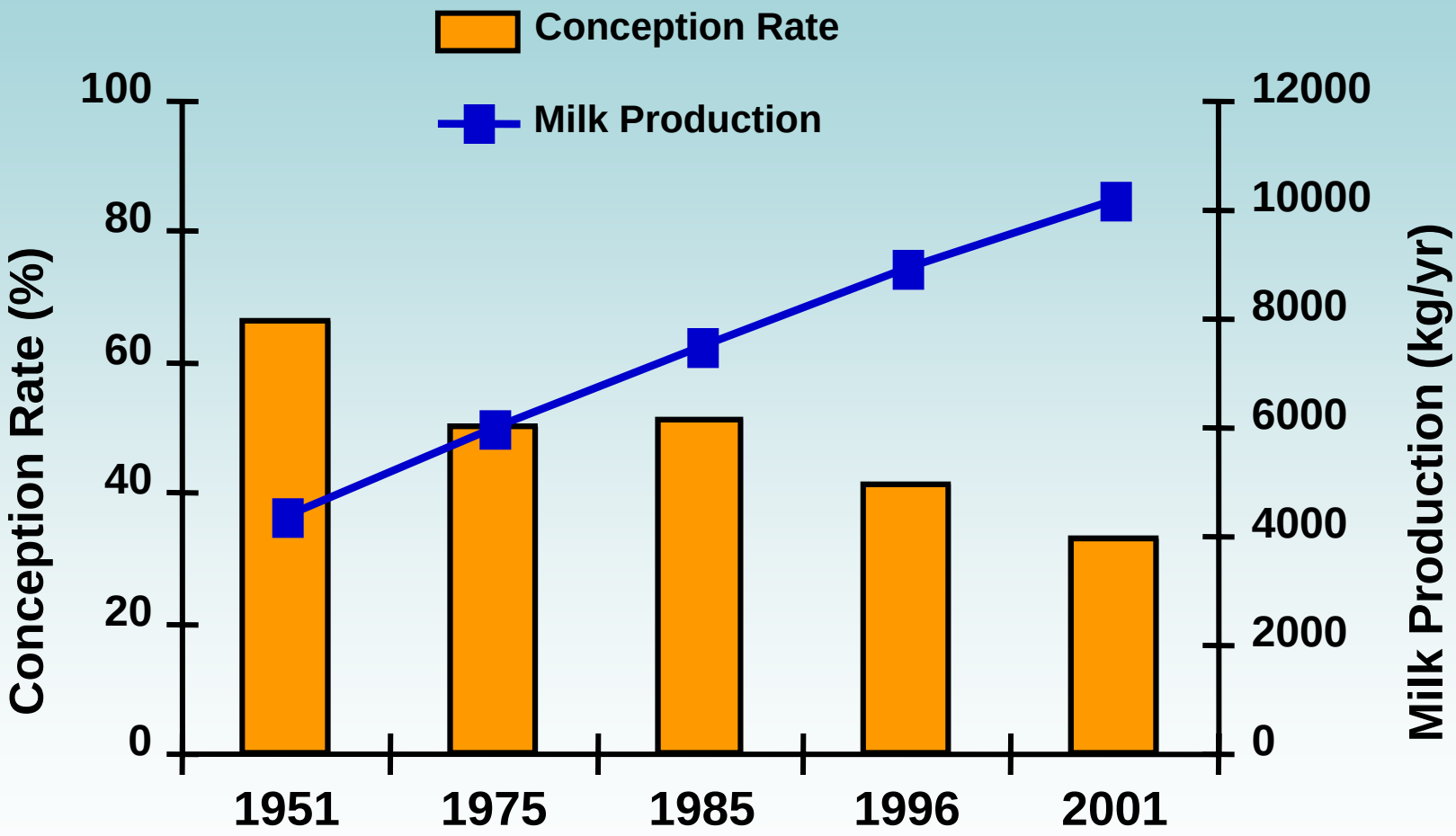
Grass utilisation

Profit

- Optimum date is the earliest possible date which avoids grass silage use in the milking cow diet.

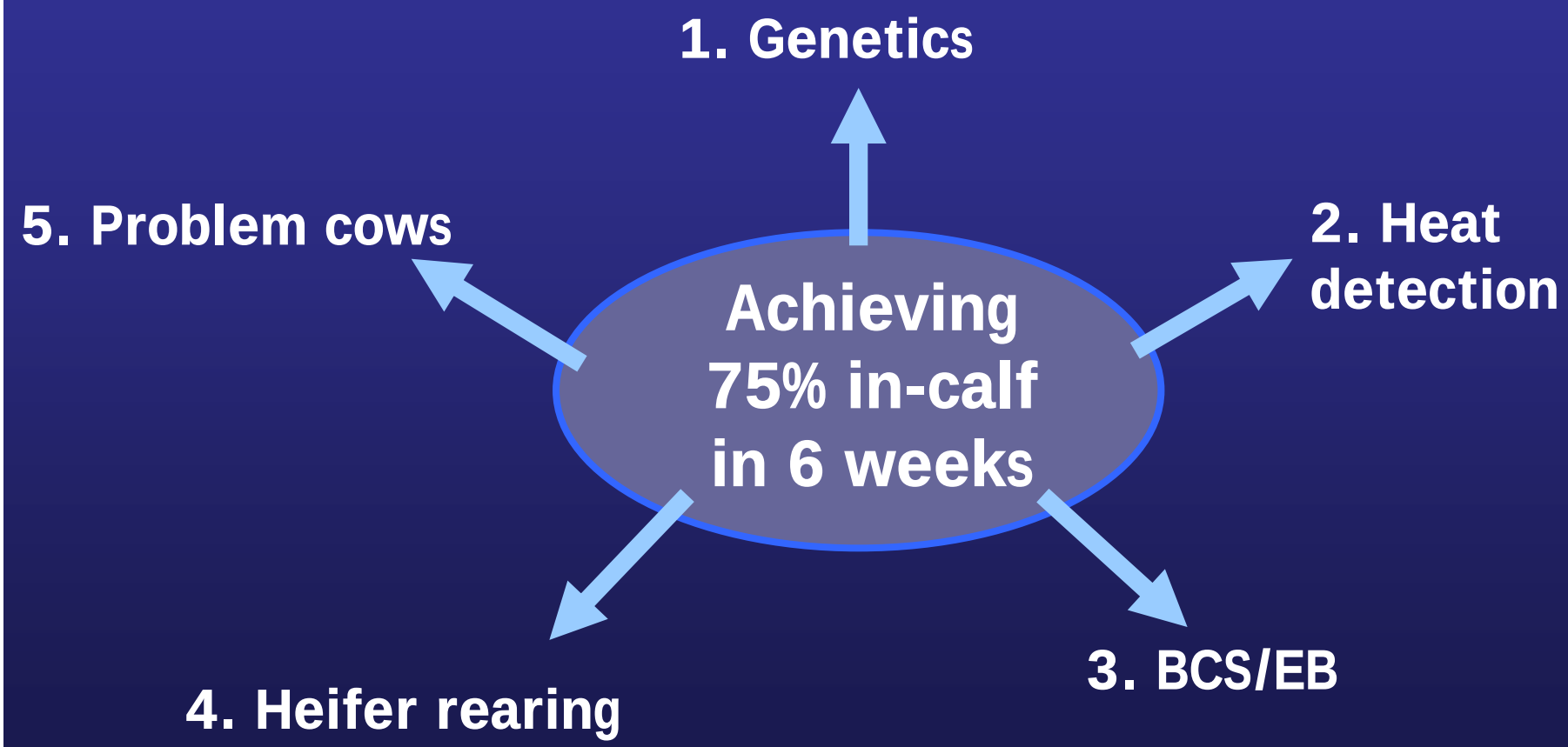


Milk Production and Fertility in New York Dairy Cows



Butler, 2003

Factors influencing fertility



1. Genetics

Moorepark Research Herds 1995-2004

	Quintiles					
	1	2	3	4	5	Sig
PD calving interval (days)	2.17	0.59	-0.5	-1.18	-2.09	
Preg rate 1st AI (%)	44^{a}	46^{a}	56^{b}	57^{b}	58^{b}	**
6-week in calf rate (%)	57^{a}	57^{a}	70^{b}	69^{b}	68^{b}	**
Overall preg rate %	80^{a}	81^{a}	86^{ab}	91^{b}	91^{b}	**
BCS at 1st AI	2.65^{a}	2.75^{b}	2.94^{c}	2.98^{cd}	3.03^{d}	***

Dillon et al., 2006

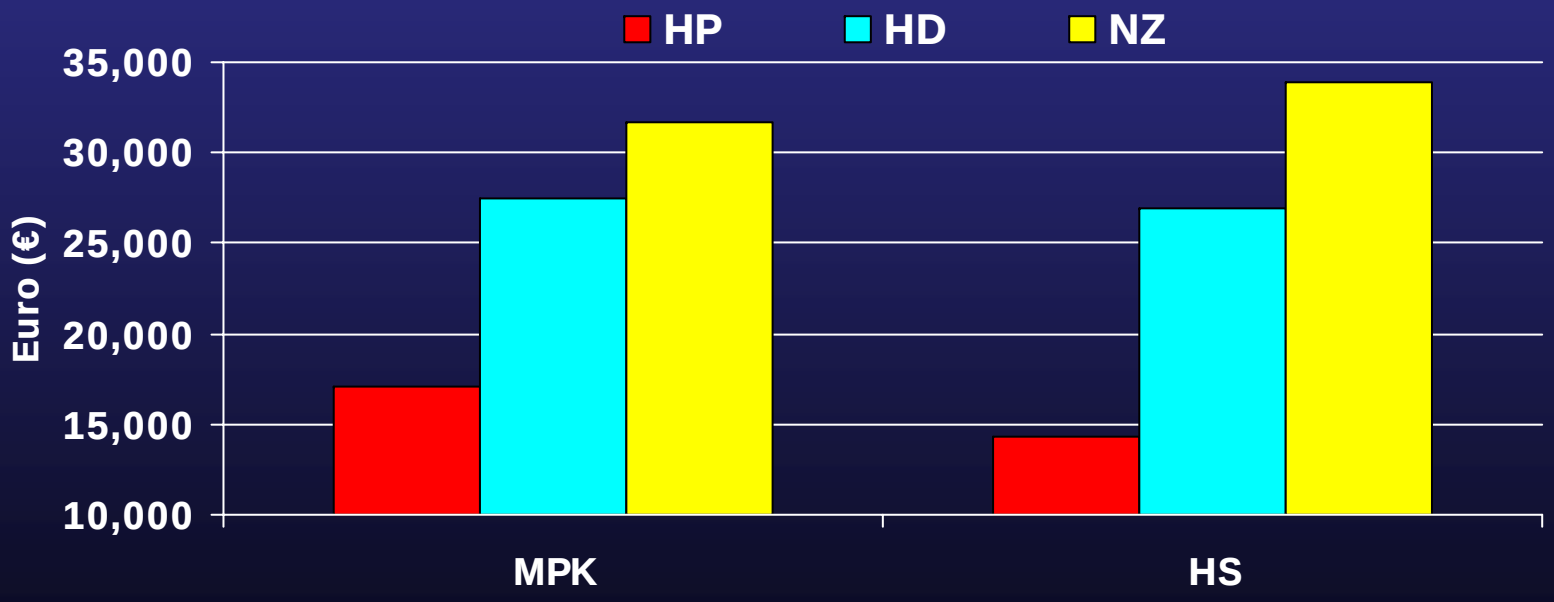
Consequences of genetic selection for milk production only

- **Increased calving interval:**
  - Lower number of replacements
  - Lower annual milk yield per cow
  - Slippage from a more profitable month of calving
  - Higher veterinary costs

- **Increased replacement rates:**
  - Lower average herd production → Age profile
  - Increased replacement costs

Effect of breeding on profitability

- Quota abolition will require an animal with high milk solids but also excellent fertility
  - High EBI sires



(McCarthy et al., 2007)

2. Heat detection

Reasons for not using more AI by AI use category

AI usage	None	0-40%	41-75%	76-95%	>95%
AI cost	16.1	14.7	7.8	13.3	-
Labour	10.7	32.4	23.5	6.7	50.0
Heat detection ability	26.8	11.8	13.7	26.7	37.5
Bulls	10.7	2.9	7.8	6.7	-
Facilities	1.8	-	5.9	6.7	-
Inconvenience of AI	21.4	32.4	23.5	13.3	12.5
Other	12.5	5.9	17.7	26.7	-

Shalloo et al., 2004

Do you use heat detection aids?
Yes: 58.9%, No: 41.1%

Heat detection aid	%
Tail paint	93.9
Vas. Bull	4.1
Kamar	0.7
Combination	0
Other	1.4

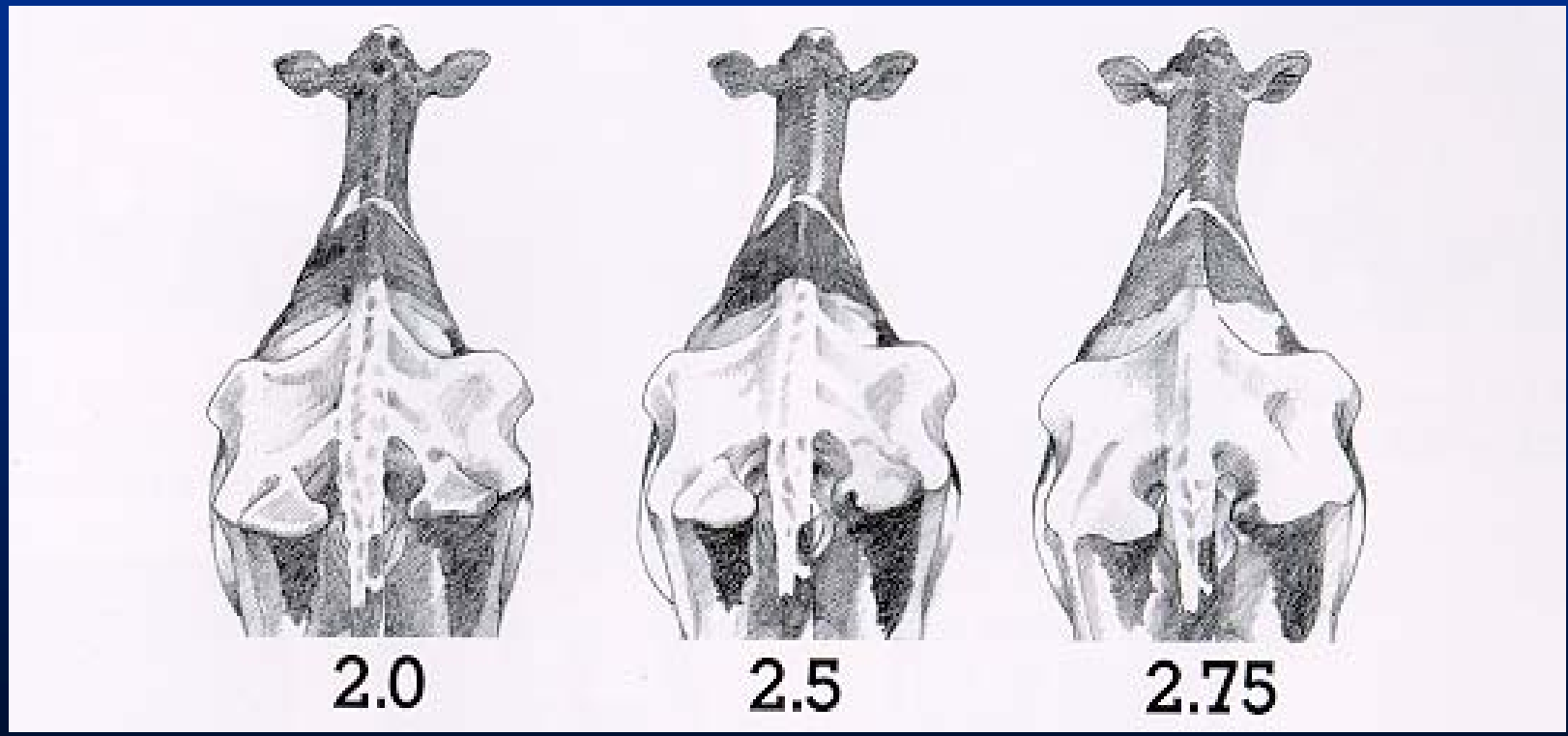
Shalloo et al., 2004

Heat Detection Aids

- Tail Paint/Paint stick
- Estrotect “scratch card”
- Checkmate
- Vasec. Bull with chinball
- Activity monitoring

3. BCS

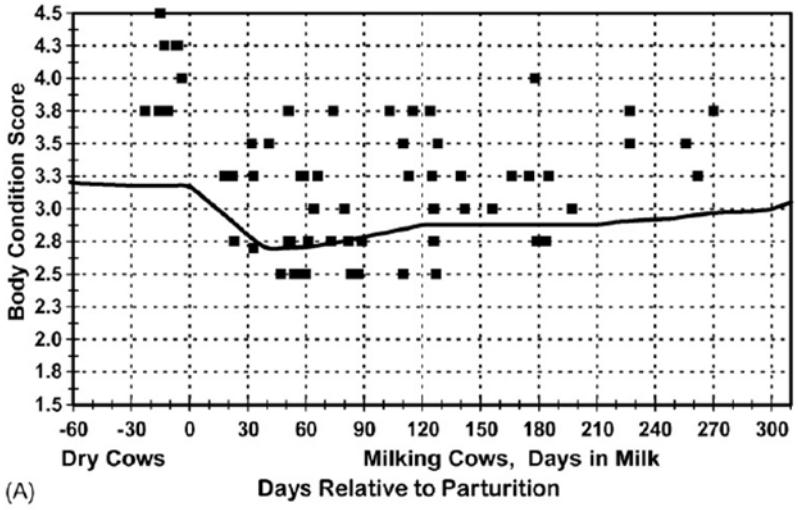
Body condition matters; Low BCS = low reproductive rates

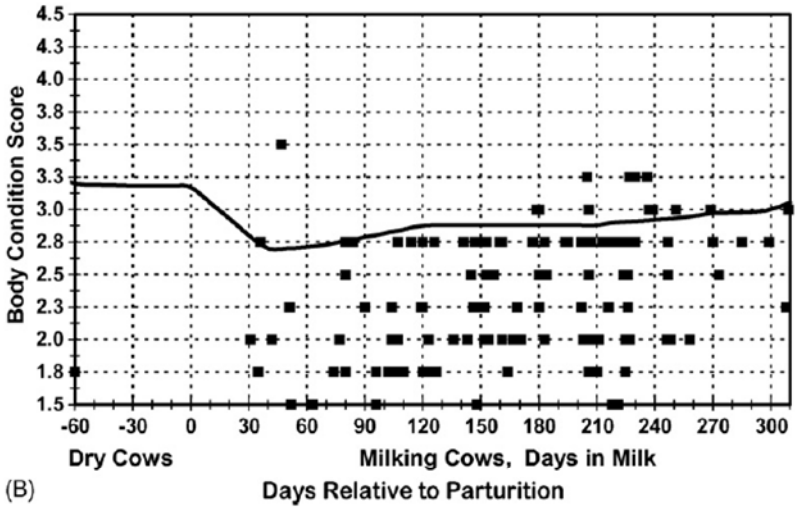


Picture courtesy of Elanco Animal Health

Two herds; two postpartum BCS profiles

"As the percentage of faults increased from 15% to 45%, the percentage of cows in the herd that were pregnant by 150 days postpartum decreased linearly from 80% to 52%"





Weigel (2006) Anim. Reprod. Sci. 96:323-330; Caraviello (2005)

4. Replacement heifer management

Heifer management

- Calve at 22 – 24 months of age
- Must calve at the start of calving period
- Must achieve targets
  - Puberty at 10 – 12 mo, 270 – 300 kg BW
  - 90% cycling by MSD (320 kg BW, 3.0 BCS)
  - Concieve at 13 – 15 mo
- Breed to easy calving high EBI dairy sire
- Use synchrony to achieve compact calving

5. Problem cows and good records

Good records

- Peripartum disorders increase risk of poor fertility
- Keep records of cows with twins, dystocia, milk fever, RFM, metritis, DA, ketosis etc.
- Cows that are thin or lose a lot of BCS at risk of anoestrus
- Examine these cows prior to MSD
- Treat as necessary

Conclusion

- **The competitiveness of Irish milk production is greatly reduced by poor reproductive performance**
- **What is required next spring:**
  - **At least 6-weeks of AI using only dairy high EBI genetics**
  - **Choose heat detection aids that best suit your farm to increase submission rates**
  - **Calve cows at optimum BCS and minimise loss between calving and AI**
  - **With the help of good records identify cows with problems early in the breeding season and use appropriate treatment**
  - **Use good rearing management and synchronise replacement heifers to calve (using high EBI easy calving sires) in the first 2 weeks of the calving season**