

AI Promotion 2006.
Breeding Future Profits.

Breeding Workshop for
Stakeholders.
March 2006



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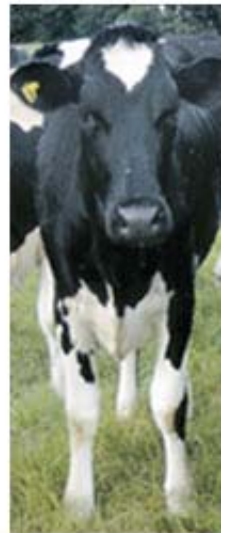
Agenda

- We are in Crisis – ICBF
- Decline in AI usage: NFS supplementary survey – Teagasc Moorepark
- Breeding better replacements - ICBF
- Why use EBI – Teagasc Advisory
- Planning the breeding season – Teagasc Advisory
- Increasing AI in 2006: Key factors – Participants (work-group sessions).



We are in Crisis!

- AI has dropped to historic (and international) low levels.
- EBI now developed.
- International competitiveness?
- Across industry initiative with four parts in 2006:
 - Workshop
 - Advertisements
 - MART Events
 - Survey & plan for 2007





NATIONAL
CATTLE BREEDING
CENTRE



Bova AI
Cattle Breeding Service



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Decline in AI usage - NFS Supplementary Survey

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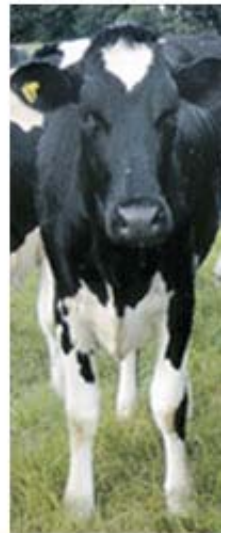
NFS

- **Survey carried out annually**
- **Sample size of 1200 farmers**
- **Sample weighted in order for it to be representative of all farmers in the country**
- **Approximately 400 dairy and suckler farmers**
- **Supplementary survey twice yearly**



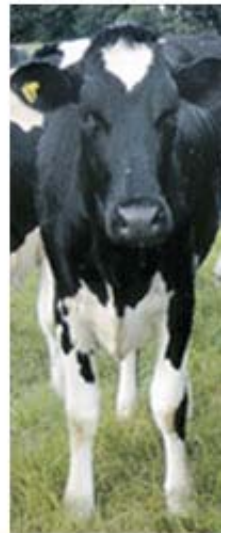
Dairy and Cattle Breeding Questionnaire

- 340 respondents to the dairy survey
- 24 removed due to exiting in the next 3 years
- Average farm size was 56.3ha
- Average herd size was 54 cows
- Average age of respondents was 49 years



Do you plan to remain in dairying for the next 3 years?

- **Yes: 92.2**
- **No: 7.8**



Question 1 Do you use AI?

(P value < 0.001)



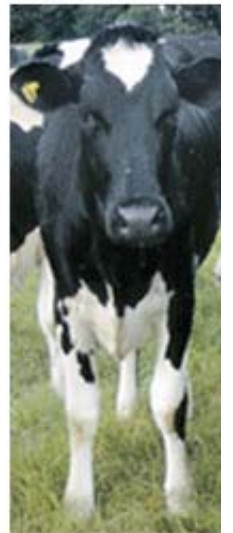
- **Yes 87.6%**

- **No 12.4%**



What percentage of cows and heifers did you mate to AI in 2004?

- **Region = Not significant**
 - **Age = Not significant**
- **Dairy herd size = Significant**



Herd Size

Dairy herd size	Cows to AI %	Heifers to AI%
1 (1-33)	68.0	59.1
2 (34-43)	58.7	50.5
3 (44-54)	49.2	39.5
4 (55-66)	54.4	36.3
5 (67-211)	55.0	35.3
P value	0.119	0.019



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What percentage of cows and heifers did you mate to AI in 2004 to breed replacement animals?

- **Region = Not significant**
 - **Age = Not significant**
- **Dairy herd size = Significant**



Herd Size

Dairy herd size	Cows to AI %	Heifers to AI%
1 (1-33)	38.0	9.2
2 (34-43)		15.6
3 (44-54)		22.6
4 (55-66)		19.5
5 (67-211)		23.3
P value	0.261	0.019



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What was the reason why you didn't breed more cows to AI in 2004?

- AI usage category significant ($P < 0.001$)

1=AI costs, Labour=2,
Ability to detect heat=3,
Confidence in Bull selection=4,
Lack of suitable facilities=5,
Inconvenience in AI process=6,
Other=8,



Reasons for not more AI usage by AI use category

AI usage	None	0-40%	41-75%	76-75%	>95%
1	16.1	14.7	7.8	13.3	-
2	10.7	32.4	23.5	6.7	50.0
3	26.8	11.8	13.7	26.7	37.5
4	10.7	2.9	7.8	6.7	-
5	1.8	-	5.9	6.7	-
6	21.4	32.4	23.5	13.3	12.5
8	12.5	5.9	17.7	26.7	-



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Do you use heat detection aids?
Yes: 58.9%, No: 41.1% (P value 0.005)



Heat Detection Aids	Most	2nd most	Weighted
Tail Paint	93.9	18.8	68.9
Vas. Bull	4.1	37.5	15.2
Kamars	0.7	6.3	2.6
Combinations	0	0	0.0
Other	1.4	37.5	13.0



How often do you heat detect?

- Outside of milking times, herd size was an important factor influencing the amount of heat detection carried out (P=0.06)

Herd size	No of detections
<34	1.04 ^a
34-43	1.35 ^{ab}
44-54	1.39 ^b
55-66	1.34 ^{ab}
67-211	1.57 ^b



Q: Do you AI before introducing the stock bull?



Herd size	Yes	No
<34	39.0	61.0
34-43	61.5	38.5
44-54	76.3	23.7
55-66	74.5	25.5
67-211	87.3	12.7

Yes= 69.1%, No= 30.9% Herd size (P value <0.001)

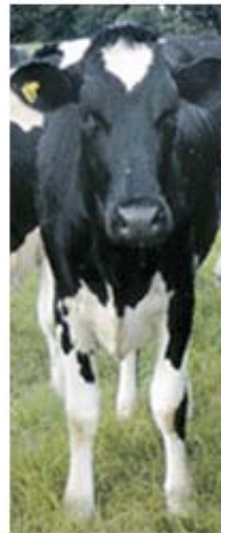
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Q: For how many weeks do you use AI before introducing the stockbull?

- **Herd size, age of farmer or region had no effect on this variable**
- **Average = 5.85 weeks**



Q: What method of AI is used?



Method of AI	%
Technician	71.4
DIY AI usage	28.2

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Q: How do you select your AI dairy bulls for dairy herds?

Reason	1 st	2 nd	3 rd	Weighted
Cost of Straw	4.4	6.1	7.5	5.5
EBI	36.7	9.8	6.9	22.8
Type traits	12.5	8.8	13.8	11.5
Bull of the day	7.7	4.2	1.2	5.5
Milk production potential	13.7	25.1	25.3	19.4
Milk constituents	18.2	25.1	18.4	20.5
Cow fertility	2.4	17.2	22.4	10.7
Other	4.4	3.7	4.6	4.2



Q: Selection criteria by Usage level?



Usage level (%)	0	1-40	41-75	76-95	>95
Cost of Straw	-	4.8	2.8	0	6.5
EBI	-	31.0	36.6	52.5	33.7
Type traits	-	19.1	8.5	22.5	7.6
Bull of the day	-	9.5	4.2	7.5	9.8
Milk production	-	16.7	14.1	5.0	16.3
Milk constituents	-	11.9	25.4	10.0	19.6
Cow fertility	-	4.8	1.4	0	3.3
Other	-	2.4	7.0	2.5	3.3

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Q: Have you heard of EBI?

Yes: 90.9, No: 9.1



Usage level (%)	0	1-40	41-75	76-99	100
Yes	82.4	90.5	97.2	92.5	90.2
No	17.6	9.5	2.8	7.5	9.8

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Q: What criteria do you use to select beef bulls for use in the dairy herd?

Characteristic	1 st	2 nd	3 rd	Weighted
Cost of Straw	2.4	6.1	22.2	6.9
Breed of Bull	35.1	32.0	11.1	30.1
Calving ease	52.4	38.8	6.7	40.3
Growth rate	1.2	10.2	31.1	9.2
Conformation	3.0	11.6	23.3	9.3
Other	6.0	1.4	5.6	4.4



Conclusions

- **Large proportion of farmers use AI**
- **55% of cows and 39% of heifers bred to AI**
- **38% of cows and 23% of heifers bred to AI for replacement purposes**
- **Labour, Ability to detect heat and inconvenience are the important reasons why more AI isn't used**
- **Fifty nine percent of farmers are using heat detection aids with tail paint the most common**



Conclusions contd.

- **Cows are heat detected 1.5 times outside of milking (Herd size significant)**
- **Average length of AI usage is 5.9 weeks**
- **Dairy bulls are selected using EBI, Milk constituents and production mainly**
- **Milk recording was higher on larger herds and herds that use more AI**
- **Breed and calving ease are the most important traits for selecting beef bulls for the dairy herd**



Breeding Better Replacements

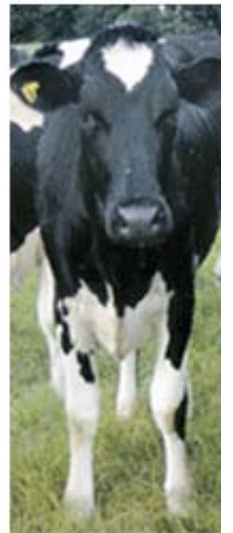
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What is EBI?

- A profit based index (€)



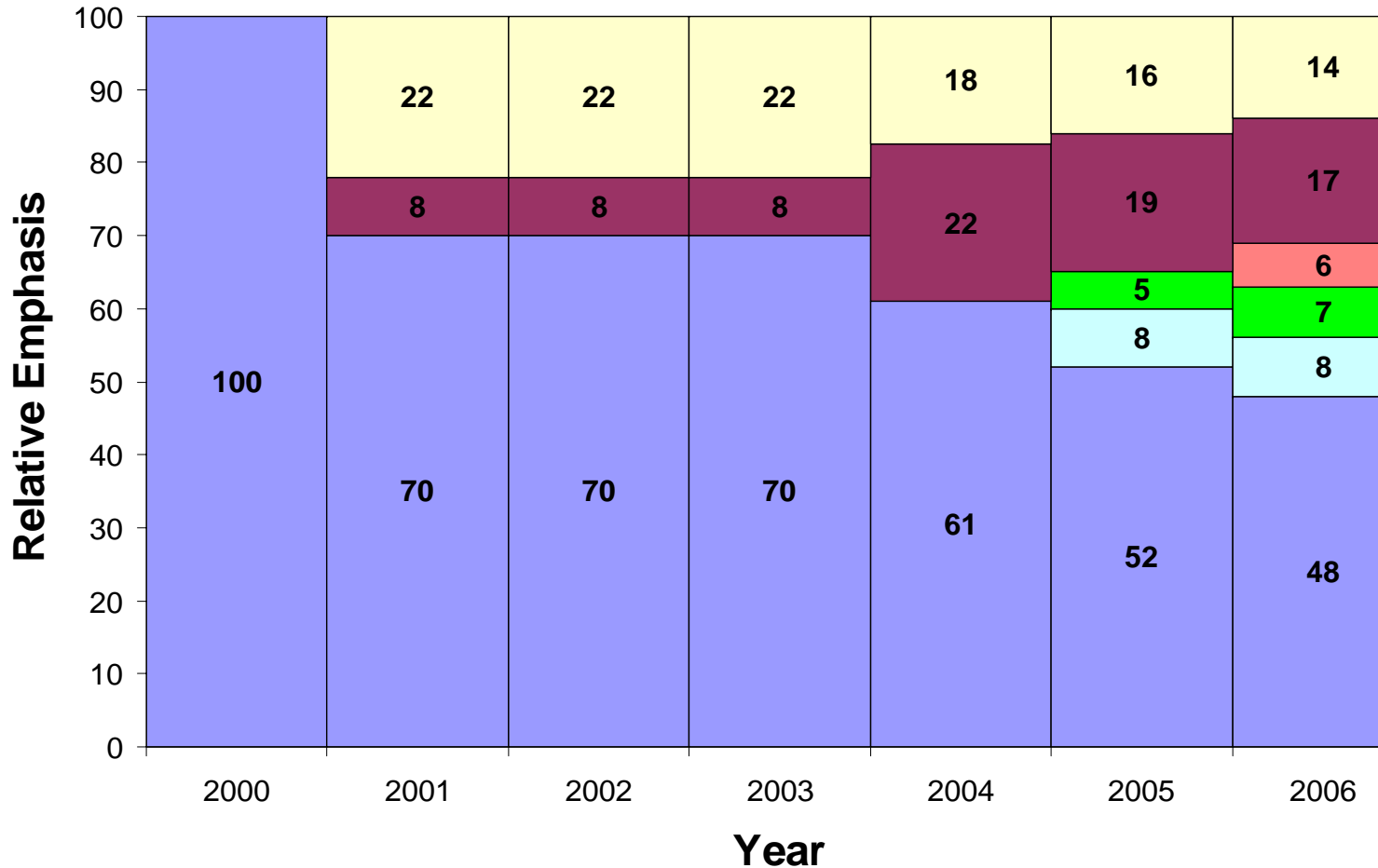
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Background to EBI

- Introduced in February 2001, replacing old RBI
- Profit based index (€/lactation)
- Included information on 2 new traits – CI & SURV
- Objective; “high profit = high solids + good fertility + long herd life”



Development of EBI



■ Production
 ■ Calving
 ■ Beef
 ■ Health
 ■ Fertility
 ■ Survival

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EBI 2006

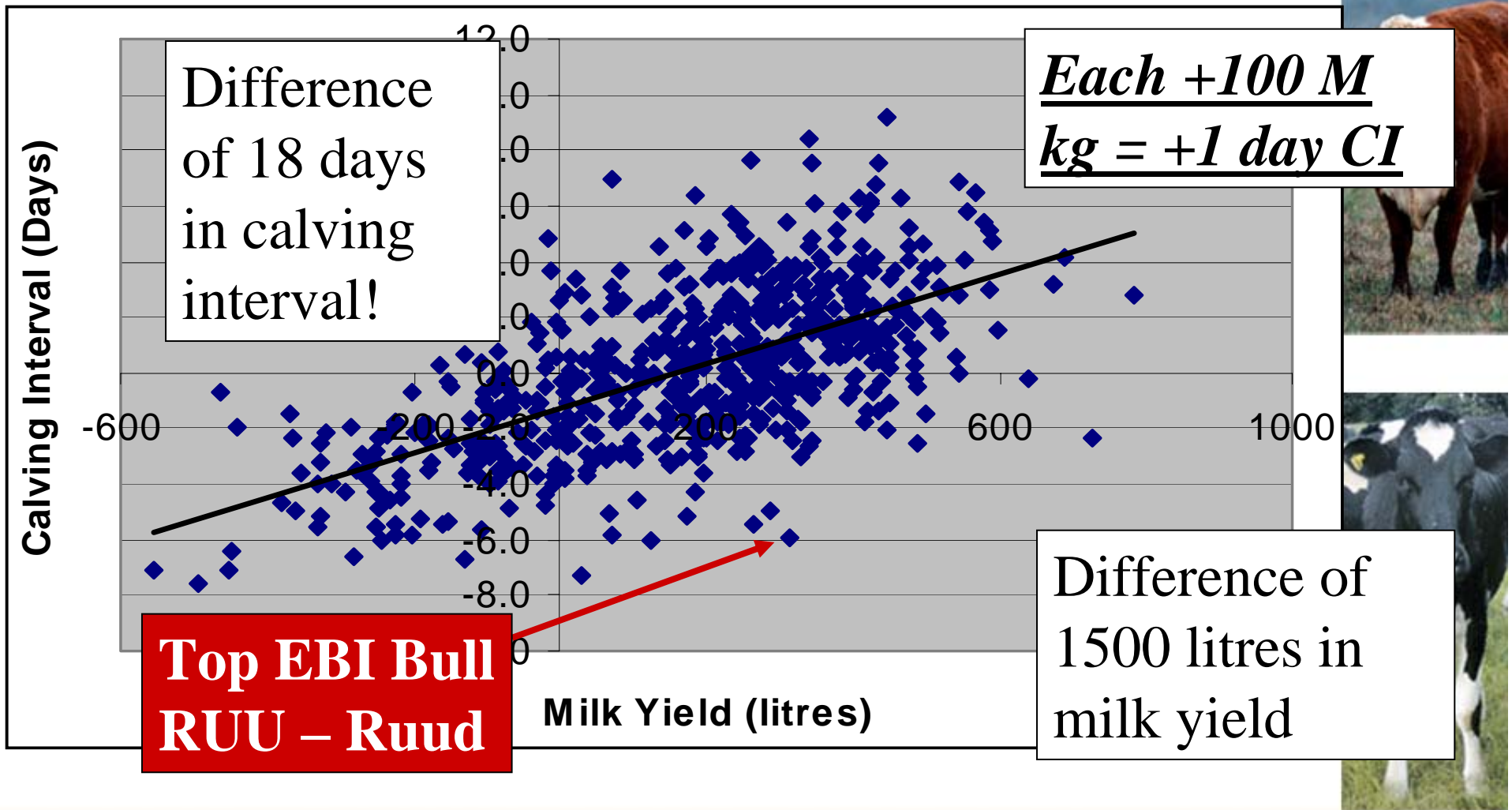
- Balance between output & costs.
- Past focus just output.
- EBI = Profit

Sub-index	Trait	EV	Importance	
Milk	Milk	-0.084	-14%	48%
	Fat	1.55	9%	
	Protein	5.27	25%	
Fertility	Calving interval	-7.17	-17%	31%
	Survival	10.8	14%	
Calving	Calving difficulty - Dir	-3.26	-3%	8%
	Calving difficulty - Mat	-1.73	-1%	
	Gestation	-4.47	-3%	
	Calf mortality	-2.58	-1%	
Beef	Cull cow	0.04	0.20%	7%
	Carcase weight	1.4	5%	
	Carcase conformation	5.99	1%	
	Carcase fat	-4.49	-1%	
Udder	SCC	-55.48	-5%	5%
Lameness	Locomotion scores	2.55	1%	1%



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EBI & AI Sires



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EBI & Reliability

- Proofs will change depending on reliability.
- Farmers should use a minimum of 3 bulls.
- Targets for progeny testing;
 - Reliability of a team of 10 bulls = 93%
 - Target for proven bulls ; 100 dtrs & 100 hrds = 80%

Index		Range	
EBI	Rel	Btm	Top
€100	30	€43	€157
€100	40	€47	€153
€100	50	€51	€149
€100	60	€57	€143
€100	70	€62	€138
€100	80	€69	€131
€100	90	€78	€122
€100	99	€93	€107



Key pointers

- A bull with an EBI of €100 will leave €100 more profit/lactation than the average animal.
- The average animal was a cow born in 1995 and milking in 2000 (EBI = €0)
 - Heifer yield of 5,700 kg, 3.73 BF, 3.32 Ptn, CI = 385 days.
- On average using a bull of +100 kg & -5 days CI on this cow will result in a heifer with; 5,800 kg milk & 380 days CI.



Why do we need a progeny test program?

- Currently achieving €5/cow/year
- Optimal gain = €23/cow/year
- Need sires proven to perform in Irish conditions.
- Highest EBI young bulls are in Ireland
- Aim to test 100 bulls with 100 daughters.
- To have confidence in AI the industry needs a new top bull each year
- ***You must promote progeny testing.***



Stock Bull vs. AI



	EBI	Reliability
Stock bulls	€8.29	44
Active bull list	€75.93	70
Top 20 active bull list	€96.75	71

- Average EBI of Stock Bulls is **€8!**
- Difference of €97-€8=€89/lactation
- 20% replacement rate = €1,600 (300k litre herd)

Summary

- EBI – a profit index (output – costs)
- Evolving as more & better information becomes available.
- Breeding programs under-developed
 - Too much stock bull (low EBI & low rel).
 - Need to scale up progeny testing
 - Aim to test 100 bulls/year
 - New “top bull” each year & increased genetic gain for farmers/industry (€23/cow/year or 0.5 cents/litre).



Why use EBI?

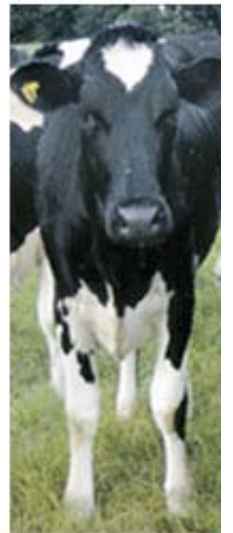
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Current situation.

- Replacement Rate = 26%
- Calving Interval = 394 days
- EBI = €24



Breeding Targets

- Replacement Rate of **18%**
- Calving Interval of **365 days**
- Herd EBI + **€5** per year or **€75** by 2015
- Calving pattern **70 : 20 : 10** and **75%** calved in first 6 weeks



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Cost of not meeting targets

- Replacement Rate **> 18%**
 - Loss in profit of **0.14 cpl** per % over 18%
- Calving Interval **> 365 days**
 - Loss in profit of **0.12 cpl** per day over 365 days
- For every **€5** increase in EBI, profit will increase by **0.7 cpl**



Breeding Targets

- 400,000 litres produced
- Calving Interval = 380 days
- Replacement rate = 30%



	Actual – Target	cpl	This herd, €
Calv. Int.	380 – 365 = 15	0.12	6,720
Repl. Rate	30 – 18 = 12	0.14	7,200
Total			€13,920



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EBI & Fertility

<i>Quintile</i>	<i>Q1</i>	<i>Q2</i>	<i>Q3</i>	<i>Q4</i>	<i>Q5</i>	<i>Sig.</i>
<i>EBI (€)</i>	<i>15</i>	<i>27</i>	<i>34</i>	<i>37</i>	<i>50</i>	
PD calving interval (days)	2.17	0.59	-0.5	-1.18	-2.09	
PD survival (%)	-0.85	-0.14	0.14	0.34	0.99	
Pregnant to first service (%)	44	46	56	57	58	**
Services per cow (no)	2.03	1.91	1.82	1.67	1.74	**
Six week in calf rate (%)	57	57a	70	69	68	**
<i>Pregnancy rate (%)</i>	<i>80</i>	<i>81</i>	<i>86</i>	<i>91</i>	<i>91</i>	**

- Results from 15 years of Teagasc research
- Selection on EBI = more fertile cows.
- Similar trends for milk solids.
- **EBI is pointing farmers in the right direction.**



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EBI – Making more money

	EBI	Milk kg	Fat kg (%)	Pr kg (%)	CI	
High group EBI	€100	5,740	232 (4.05)	217 (3.75)	365	
Bottom group EBI	€34	5,730	215 (3.75)	207 (3.62)	379	
Difference	€66	+ 10	+ 17	+ 10	-14	Total
Value		- €1	€26	€52	€99	€176

- Profit difference per 40 cows is €7,000



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EBI – milk price & common profit

EBI + €5

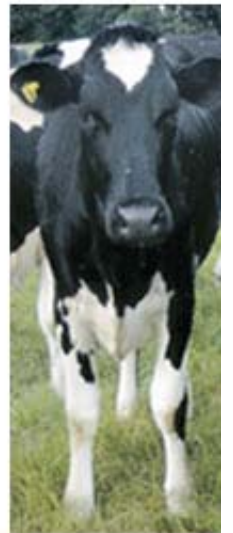
- milk price + 0.07 cpl
- common profit + 0.3 cpl
- For a 400,000 litre herd, increasing EBI by €5 will increase milk price by + €280
- Increase common profit by + €1,200



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Summary

- High EBI = High Profit
- High Profit from improved
 - milk solids
 - fertility



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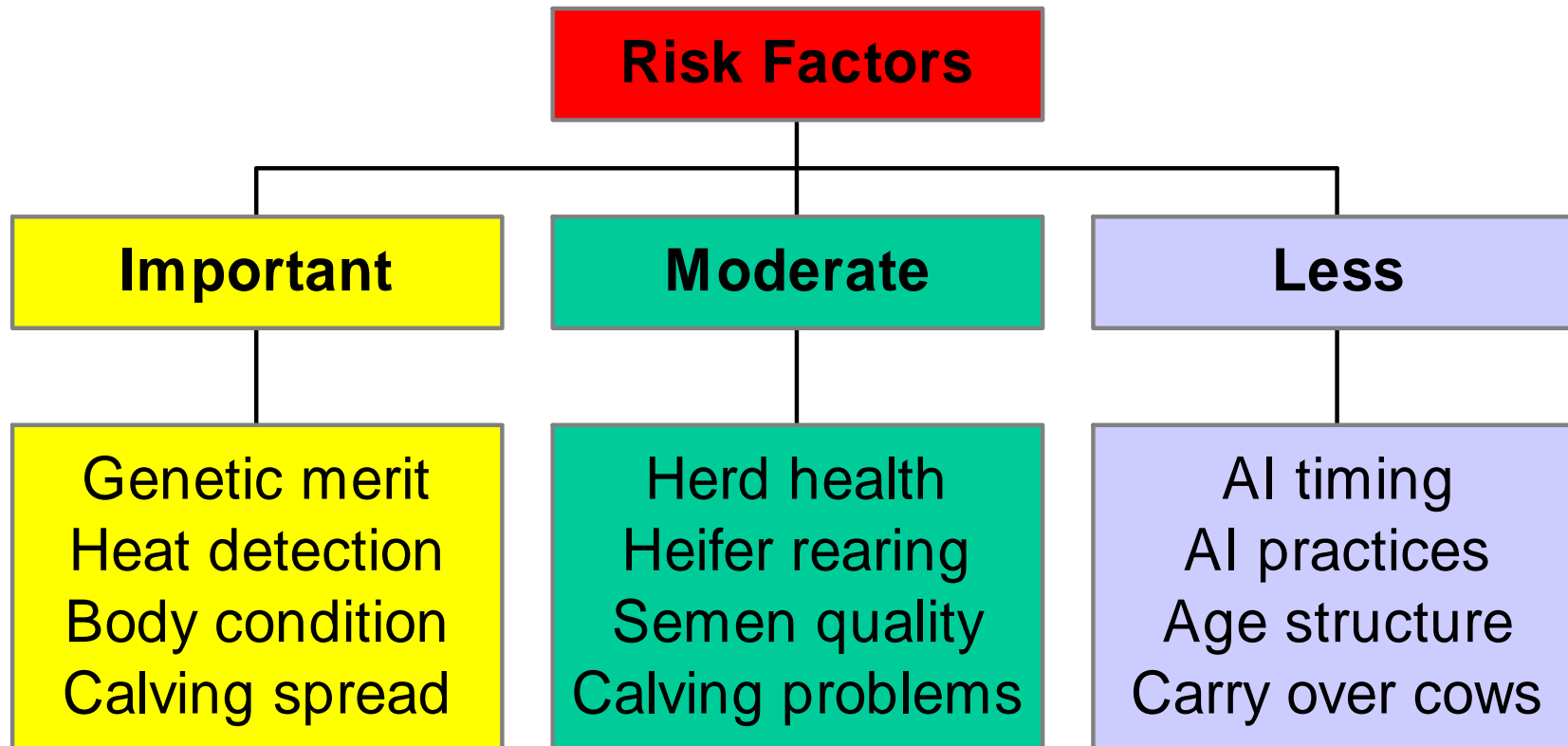
Planning the breeding season

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What's Important in Herd Fertility?



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EBI & Fertility

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Services per cow (no)	2.03	1.91	1.82	1.67	1.74	**
Six week in calf rate (%)	57	57a	70	69	68	**
<i>Pregnancy rate (%)</i>	<i>80</i>	<i>81</i>	<i>86</i>	<i>91</i>	<i>91</i>	<i>**</i>



- **Genetics - the one guaranteed way to improve fertility.**

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Heat Detection, Conception Rate & Overall Pregnancy Rate

		Conception Rate			
		60	50	40	30
Heat Detection Rate	90	96	91	83	71
	70	91	82	73	61
	50	76	68	59	48
	40	67	59	50	40

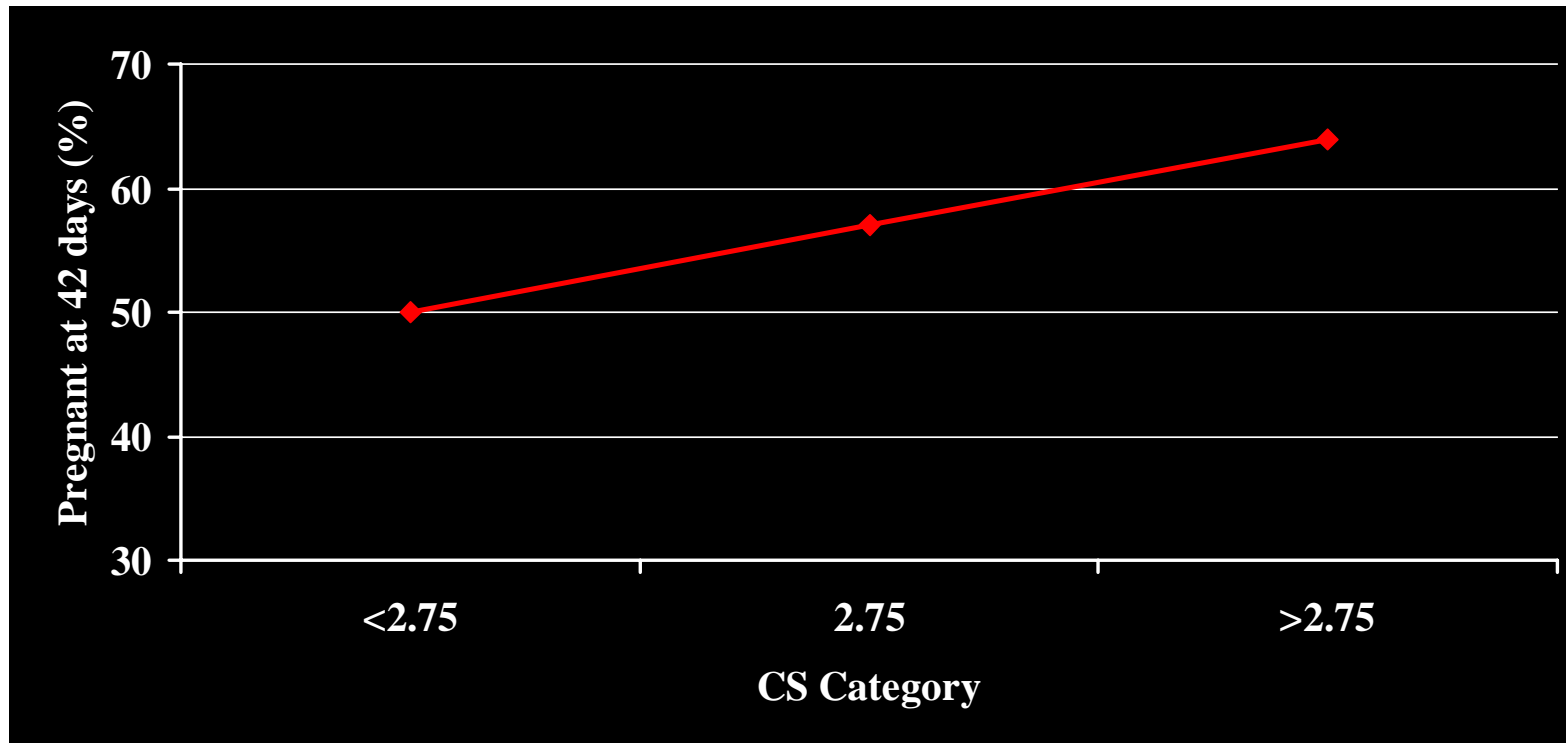
- Aids to heat detection; tail paint, kamars, oestrus-aid

Calving to service interval

Calving to service (days)	Pregnancy Rate (%)
>75	57
61-75	52
46-60	49
<46	35



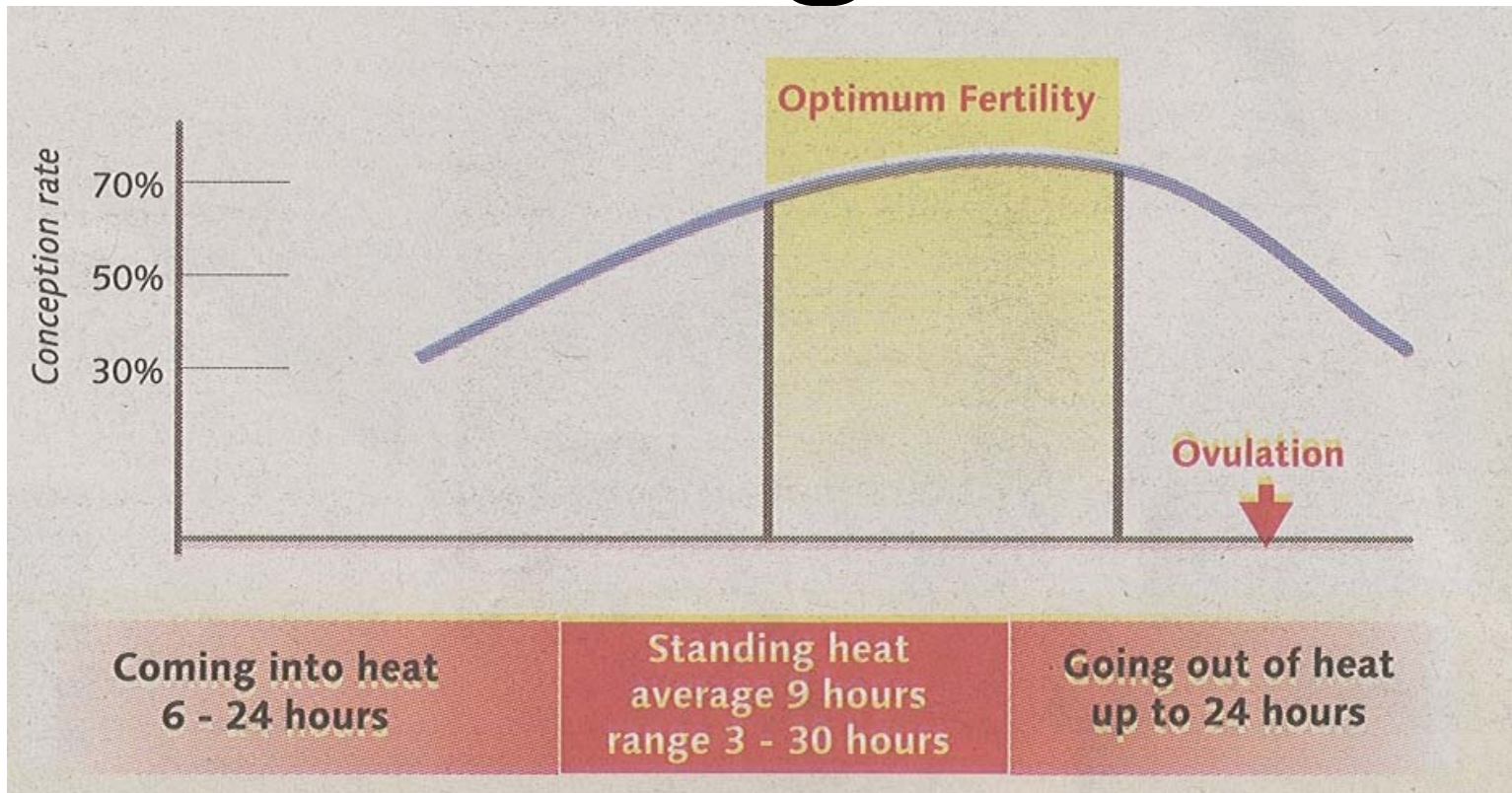
BODY CONDITION SCORE & PREGNANCY RATE AFTER 6WKS



- Excessive loss also reduces pregnancy rate

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Timing of AI



- Bulling in early morning = serve that morning
- Bulling in afternoon/evening = serve next morning

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INSEMINATION FACTORS

- **DIY v Commercial AI service**
 - ☞ No difference in average pregnancy rates
 - ☞ No difference in variation
- **Fresh v Frozen-thawed semen**
- **AI sire (greater than 50 inseminations)**
 - ☞ Large differences between sires
- **AI v Natural service**
 - ☞ No difference



Breeding season targets

- **Overall**

- 365 day calving interval
- 80% herd calved in 6 weeks
- 10% herd empty at end of a 13 week breeding season

- **3 week breeding season targets**

- 90% of cows bred
- All cows calved 40 days bred or treated



Straws per replacement heifer

- **Target no. at calving :** 10
- **No. for breeding :** 12
- **No. live at birth :** 13
- **No. dead at birth :** 1
- **No. pregnancies :** 28
- **No. AI straws :** 56
- **Straws per replacement :** 5.6



Breeding Heifers

- Birth Date: Jan – March
- Target Bulling Weight: 330 Kgs
- Cycling
- Plane of Nutrition
- Bred 1 week ahead of (or as soon as) main dairy herd
- Use high EBI “easy-calving” AI sires.



Herd EBI Reports

Economic Breeding Index (EBI) Herd Summary Report - Sept 2005

Herd Owner:
Herd Number:

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Group	Num of Cows	M Kg F Kg P Kg	F% P %	Surv% CI Days	Milk Solids Calving	Fertility Beef	EBI € EBI Rel (%)
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1. Active Cows in Milk Recording

Average EBI for all Holstein Friesian cows with; (i) a known sire (or milk recorded progeny with a known sire), (ii) valid lactation record (between 1 and 5) and (iii) are currently on your farm.

Overall	52	81			€ 10.2	€ 7.5	€ 18
		2.0	-0.02	-0.0	€ -0.3	€ 0.6	16%
		2.6	0	-1.1			
1st Lactation	21	126			€ 16	€ 6.3	€ 21
		2.9	-0.03	0.0	€ -0.4	€ -0.4	22%
		4.2	0	-0.9			
2nd Lactation	16	140			€ 19	€ 4.5	€ 25
		4.3	-0.02	-0.2	€ -0.2	€ 1.9	21%
		4.5	0	-0.9			
4th Lactation (+)	15	-44			€ -7.2	€ 12.6	€ 5
		-1.8	0.00	0.0	€ 0	€ 0	3%
		-1.5	0	-1.8			

- EBI Report: Starting point for herd breeding decisions
- EBI target improvement = €5/year



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ICBF Active Bull List

Code	Name of Bull	Owner	EBI	Rel	Dau	Hrd	Milk	Fert	Calv	Beef	Healt	Milk	CI	SUV
RUU	RUUD	NCBC	€159	77	81	56	€53	€67	€19	€15	€5	205	-5.9	2.3
OJI	O-BEE MANFRED JUSTIC	Euro/AI	€118	53	0	0	€76	€12	€25	-€3	€8	572	0.1	1.2
HFL	HEDRA FESTIVAL	Dovea	€108	90	342	152	€61	€24	€21	€4	-€2	227	-1.8	1.0
BWZ	ZANDER KEET	NZG	€107	69	0	0	€81	€0	€22	€12	-€7	220	-0.2	-0.1
NHS	NEWHOUSE SJOERD	NCBC	€106	90	2187	680	€93	€17	€3	€4	-€11	183	-1.4	0.7
ERC	CEN ERRI	Euro/AI	€100	87	345	112	€76	€24	-€11	€19	-€8	161	-3.4	0.0
UYC	COLLINS ROYAL HUGO	NZG	€99	95	2065	266	€74	€33	€9	-€12	-€5	56	-3.6	0.7
TIH	TITTENSER HYLKE	Dovea	€93	79	114	64	€25	€68	€14	-€16	€3	-216	-6.8	1.7
RDU	RUUD 96	NCBC	€92	59	47	29	€66	€1	€15	€13	-€3	394	0.9	0.7
NDI	NOORDER DUSTIN	NCBC	€90	75	0	0	€56	€10	€9	€14	€1	397	-0.5	0.6

- Use EBI report & ICBF Active Bull List to select bulls.
- Range of bulls in top 10: High EBI (RUU), high fertility (TIH), high milk (OJI)
- To achieve €5 herd improvement, must use “team of bulls” that are €50 above herd average.



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Breeding Chart



Dairy Herd Breeding Chart

HerdOwner Andrew Cromie

NID IE1231231

Yi

Cow Details														Sen		
Cow Tag	Cow FB	Cow EBI (€)	Milk (€)	CIS (€)	Calv. Diff (€)	Beef (€)	Cow's Sire	Mat Grand Sire	Lact No.	Date Calved	Calv Ease	T/A	PreService Heat	First		Sec
													Date	Date	Bull	Date
IESNYH0039U	39	-1	-5	9	-3	-2	ASE	DIJ	7							
IESNYH0061C	61	25	12	11	-2	4	ESQ	OMR	6							
IESNYH0067P	67	47	16	26	3	2	ELC	WYT	7							
IESNYH0107E	107	16	38	-14	-5	-4	DCJ	LSR	4							
IESNYH0183M	183	55	36	14	3	1	ELC	WYT	5							
IESNYH0205E	205	60	66	-1	-2	-3	ASI	COA	4							
IESNYH0208X	208	23	47	-19	-5	0	RRG	EZF	5	15-NOV-05	1	T				
IESNYH0231D	231	1	6	0	-2	-4	ASI	BUZ	5							
IESNYH0244T	244	58	72	-18	6	-2	JOS	EZB	6	19-NOV-05	2					
IESNYH0263P	263	27	39	-7	-4	-1	ESQ	WYT	6	19-OCT-05	1					
IESNYH0273L	273	45	41	5	2	-3	ASI	CAU	5	05-OCT-05	2					
IESNYH0291J	291	20	46	-20	-4	-2	FAL	KMM	5	10-OCT-05	1					
IE151013720333	333	24	17	0	5	1	HPM	ELC	4							
IE151013740335	335	53	44	8	-3	4	ASI	ARN	4							
DCL979191	348	40	62	-22	0	0	GLE	DSK	8	28-OCT-05	1					
IE151013750352	352	39	36	3	-3	4	ESQ	BRF	3							
DGL561452	359	58	58	-8	2	6	EZF	OMR	8	23-NOV-05	2					
DGL561827	362	73	69	0	-2	6	EZF	WYT	8	01-NOV-05	1					
DGL561782	368	64	50	14	3	-2	LPH	AFP	8	24-NOV-05	2					



- Easier recording of AI data.
- Balance cows & bulls for EBI.

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Typical Breeding Timetable

Issue	Date	Comment
Pre-breeding	27 th March	<ul style="list-style-type: none"> • Start 28 days pre-breeding • Tail paint • Keep records
Start	24 th April	<ul style="list-style-type: none"> • Record inseminations •
Vet exam	17 th May	<ul style="list-style-type: none"> • Examine cows calved 40+ days
Beef bull/AI	9 th June	<ul style="list-style-type: none"> • Calving difficulty not required
Finish breeding	24 th July	<ul style="list-style-type: none"> • Cut off date vital to maintain compact calving



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Summary

- Important factors: genetics, heat detection, BCS & calving spread.
- Not as important: Timing of AI & insemination factors.
- 5.5 dairy AI straws required per replacement.
- Use ICBF Active Bull List & herd EBI report.
- Plan your breeding season – start now.
- **Fail to plan.....plan to fail.**



Increasing AI in 2006: Key factors.

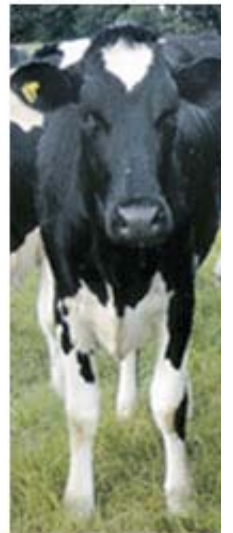
Breeding Workshop for Stakeholders.
March 2006



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Increasing AI in 2006

- Working in groups: “What are the **5 key factors that will increase AI in 2006**”?
- Feedback & discussion.





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