To Keep or Cull?

The Economics of Recycling Cows

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Background

- Recycling (carryover) cows an accepted part of the system
  - Mean calving interval 436 days
- Reduces direct cost of empty culling rate
- Late calving spring cows contribute winter litres
- Saleable heifers- keep mature cows
- Reduced focus on criteria for compact calving?
  - Submission rate
  - 6 week in calf rate
  - Genetics for fertility

A high culling rate does not come cheap…

Table 1. Direct cost of additional culling rate for a 100-cow herd

	Replacement/Cull Value Differential		
Additional Empty Culling Rate	***€400***	***€600***	***€800***
4%	€1,600	€2,400	€3,200
6%	€2,400	€3,600	€4,800
8%	€3,200	€4,800	€6,400
10%	€4,000	€6,000	€8,000

Table 2. Culling rate and milk revenue loss due to reduced herd maturity for a 100-cow herd

	Herd base milk production level (litres)		
Additional Empty Culling Rate	***6000***	***7000***	***8000***
4%	€1,293	€1,510	€1,701
6%	€1,939	€2,266	€2,552
8%	€2,585	€3,021	€3,403
10%	€3,231	€3,776	€4,253

Background

- Significant direct culling cost at high empty rate
- Recycling cows mitigates this cost may have indirect effects on
  - Milk volume sales
  - Feed cost
  - Youngstock numbers and management
- Calving Interval is the driver of these effects
- Can be quantified

Calving Interval- Effects on Milk Yield

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Calving Interval- Effect on Milk Yield

- Milk yield performance can be quoted as
  - 305-day milk recorded yield
  - Lactation total
  - Annual

- Increasing from a 365-day calving interval results in
  - Higher lactation yield
  - Lower annual yield

Calving Interval and annual milk yield

Animal Details

Jumbo Tag	
Name	
DOB	08-Nov-04 7y 3m
Breed	HO 93.8% FR 3.1%
EBI Rank	1
In Herd	Born In herd
Status	Milking
Due Calve	21-OCT-12 HYZ ExpEBI € 215

Details & EBI Indexes

Sire	
Dam	
Dam's Sire	

EBI	Milk	Fert	Calv	Beef	Mainten	Health
€ 189	€ 70	€ 97	€ 25	-€ 12	€ 8	€ 2

Milk Kg	Fat Kg	Prot Kg	Fat %	Prot %	Calv. Int.	Survival
194	18.5	11	0.2	0.08	-5.7 days	2.4%

Calving & Fertility

Milk Production

Lact	Calved	Calf Tag	Sex	On Farm	Num Serve	Calv Int	Milk kg	Fat kg	Prot kg	Fat %	Prot %	F+P kg	SCC	Days
1	03-Oct-07	70939	M	N	1		6549	299	236	4.57	3.6	535	952	274
2	01-Sep-08	60987									71	731	39	333
3	23-Sep-09	51092									66	671	73	297
4	11-Sep-10	11171									67	775	55	354
5	05-Nov-11	61291	M	Y	2	420	2026	92	65	4.52	3.19	156	28	68
				Avg (Comp)		374	7984	387	291	4.84	3.64	678	280	315
				Lifetime Production			33960	1641	1227	4.83	3.61	2868		1326

Annual Yield 7786 kg: 98% of quoted

Calving Interval and annual milk yield

Animal Details

Jumbo		
Tag		
Name		
DOB	20-Sep-05	6y 5m
Breed	HO 93.8%	FR 3.1%
EBI Rank	170	
In Herd	Born In herd	
Status	Milking	
Due Calve	12-SEP-12 IRP	ExpEBI € 100

Details & EBI Indexes

Sire	
Dam	
Dam's Sire	LGC

EBI	Milk	Fert	Calv	Beef	Mainten	Health
-€ 5	€ 44	-€ 33	€ 3	-€ 7	-€ 7	-€ 5

Milk Kg	Fat Kg	Prot Kg	Fat %	Prot %	Calv. Int.	Survival
377	3	12	-0.19	-0.01	2.9 days	0.1%

Calving & Fertility

Milk Production

Lact	Calved	Calf Tag	Sex	On Farm	Num Serve	Calv Int	Milk kg	Fat kg	Prot kg	Fat %	Prot %	F+P kg	SCC	Days
1	04-Sep-07	41620								49	531	78	330	
2	24-Oct-08	61861								21	614	42	343	
3	20-Nov-09	92045								47	896	278	448	
4	13-May-11	92342	F	Y	2	539	6445	213	209	3.31	3.25	423	184	257
				Avg (Comp)		449	9689	352	328	3.64	3.39	680	133	374
				Lifetime Production			35513	1269	1194	3.57	3.36	2464		1378

Annual Yield 6877 kg: 71% of quoted

Calving interval affects annual yield per cow

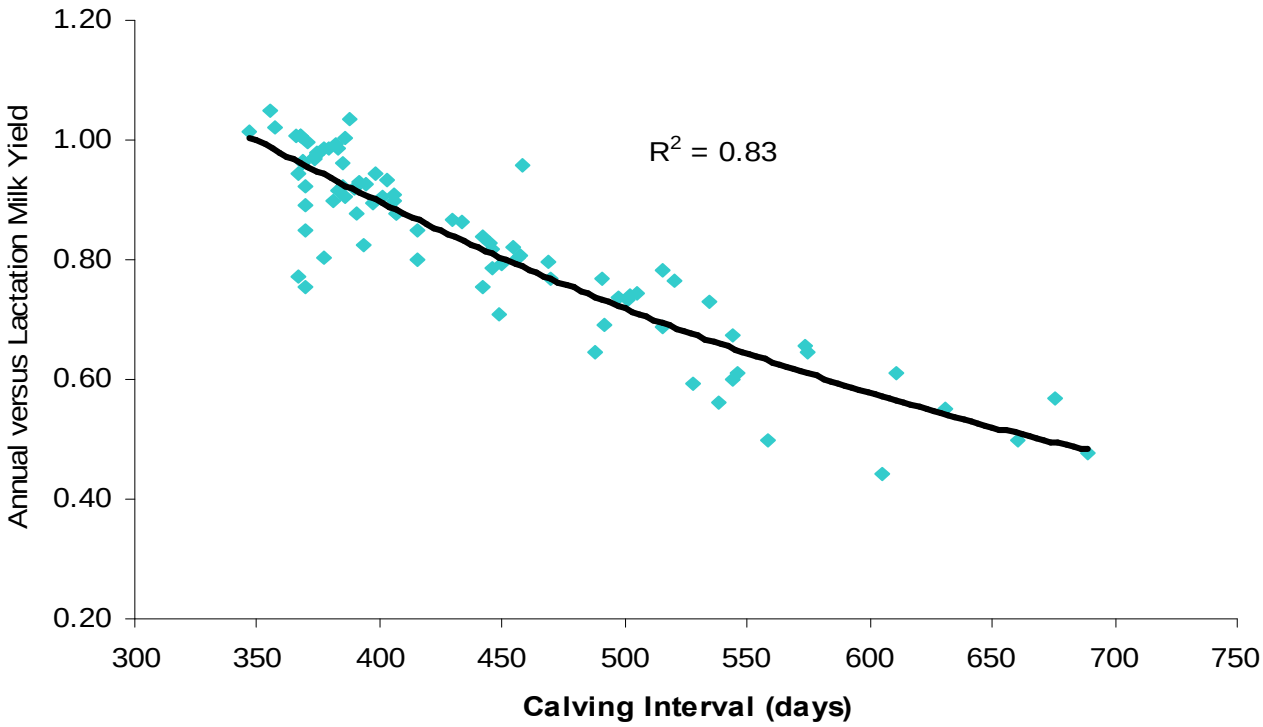

Figure 1. Association between calving interval and ratio of annual to lactation milk yield per cow in liquid milk herds

Effect of Herd Calving Interval on Milk Yield

- Herd average calving interval
  - A composite of widely ranging values within herd
  - Worst 10-15% of herd may have a disproportionate effect
- Impact of changes
  - Milk yield potential
  - Lactation persistency
  - Dry-off policy (yield and date)
- Herd-specific
- Possible to model these effects (lactation curves)

Structure of Herd Average Calving Interval

Category	Herd Average Calving Interval					
	375	**401**	**422**	**443**	**464**	**485**
365	47	25	14	8	8	2
380	34	32	22	14	3	3
400	11	11	18	18	11	4
430	5	14	14	14	14	11
450	3	6	6	9	13	13
470	0	8	8	3	8	9
490	0	4	14	17	17	21
530	0	0	4	16	16	19
550	0	0	0	1	10	18
Total Cows	***100***	***100***	***100***	***100***	***100***	***100***

Effect of Herd Calving Interval on Annual Milk Yield

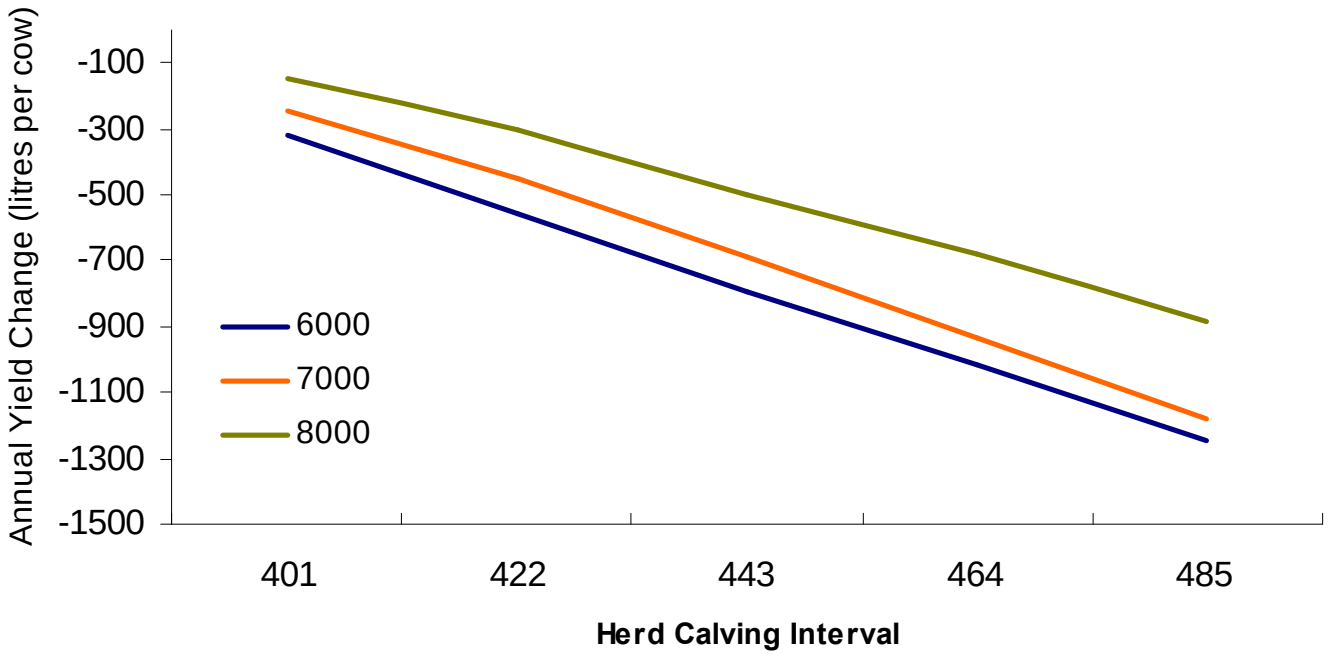

Figure 2. Change in annual milk yield per cow across a range in herd calving intervals, relative to a 375-day herd average

Effect of calving interval on milk revenue losses for 100 cow herd

	Herd Base[2] Production Level (litres)		
Herd Calving Interval	***6000***	***7000***	***8000***
401	€9,660[3]	€7,320	€4,380
422	€16,770	€13,620	€9,060
443	€23,760	€20,700	€14,970
464	€30,570	€28,020	€20,490
485	€37,290	€35,370	€26,520

[1]Relative to a 375 day calving interval
[2] Based on 305-d yield for a herd with 370 day calving interval
[3] Based on a 30cpl annualised milk price

Calving Interval- Effect on Feed Cost

Calving Interval- Effect on Feed Cost

- Annual feed budget cost is determined by
  - Herd milk yield potential
  - Stocking rate and forage utilised
  - Calving Pattern
- Optimized calving pattern reduces proportion of high cost milk
- Recycling cows and long calving intervals results in slippage from optimal
  - Very difficult to maintain control at >430 days herd CI
- Modelled annual feed cost of structured and unstructured calving patterns

Calving Pattern- Effect on Feed Budget Cost

Table 5. Estimated total feed budget cost of optimum versus unstructured calving pattern

	Herd Average Base Milk Yield		
Calving Pattern	***6000***	***7000***	***8000***
Optimum[1]	€46,715	€60,643	€74,928
Unstructured[2]	€53,024	€67,761	€82,533
Difference	€6,309	€7,118	€7,605

[1] Optimum pattern of 65% calving Feb-Apr and 35% calving in Oct-Dec
[2] Unstructured pattern extends season to include 15% calving Apr-Jun and 16% August-September

Calving Interval and Replacement Heifers

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Calving Interval- Effect on Replacement Numbers

- Common assumption that recycling reduces heifer requirements
  - Reduces empty culling rate in the short term
  - No evidence of a drop in overall culling rate
- Replacement heifers reared per cow an important efficiency factor
- Recycling cows reduces calves born per cow per year
  - Negative impact on youngstock numbers and value
  - Increased risk of out-of-season calving

Calving Interval- Effect on Heifer Numbers

Herd Calving Interval	Calves born per Cow per Yr	Breeding Heifers	Beef calves	Revenue Diff
375	0.97	39	54	-
401	0.91	36	50	€1,411
422	0.86	35	48	€2,424
443	0.82	33	45	€3,341
464	0.79	31	43	€4,175
485	0.75	30	41	€4,937

Per 100 cows
Assuming 5% mortality, €450 heifer calf value and €80 beef calf value

Where to from here?

Time to get serious…

1. Record and use your data

2. Work to seasonal fertility targets
   - Submit 90% of all cows eligible for breeding in the first 21 days
   - 100% of recycled cows submitted for service during week 1

3. Heat detection: Attention to detail in the early weeks

4. Bull power to compact late calvers in the summer breeding season
   - One bull per 15 to 20 non-pregnant cows at the end of AI
   - Eliminate May June and August calving

5. Herd sires must have EBI fertility sub-index of €120 or higher
   - This applies to stock bulls

6. Cull 10% cows with the worst calving interval each year

7. Block calve heifers at the start of each season (>80% in 6 weeks)

8. Manage BCS (extra days dry, high energy/low protein diets, once daily milking)

In summary

- Huge hidden cost of poor fertility in many split calving herds
  - Need to be able to show this on a herd-specific basis
- Recycling cows = Short term gain for long-term pain
- Increasing culling rate alone will not work:
  - Need to tackle the underlying reasons for the need to recycle
- An holistic herd management approach is needed
- This will take years!

Questions?

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