Timing, costs and incidences of recorded health events in NZ dairy farms

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BRIDGING SCIENCE & BUSINESS

DairyNZ

NZ dairy farming is different

Seasonal calving, pasture feeding

Cows walk long distances to milking

Calves reared in large groups

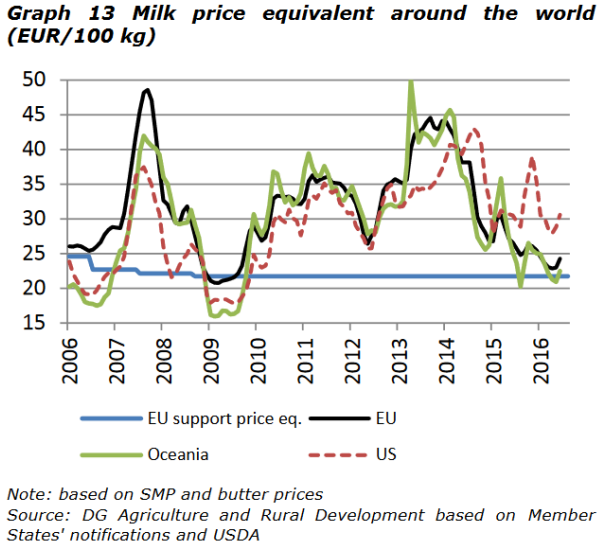
Not always so different?

Key differences

- Average milk production
  - 4400 litres per year
  - 154kg protein
  - 205kg fat
- Average herd size
  - 419 cows per herd
  - 600 herds have >1000 cows
- NZ$1.00 = €0.64 (All results presented in **Euro**)

Health events are important

Animal welfare



Farm profit

Ease of management

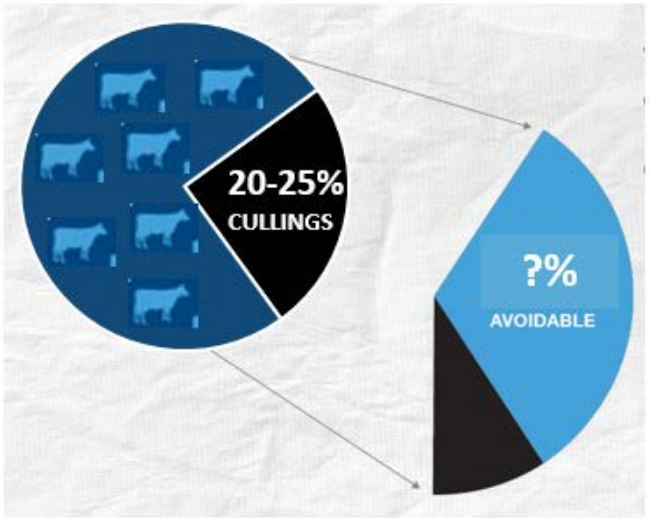
What do we need to find out?

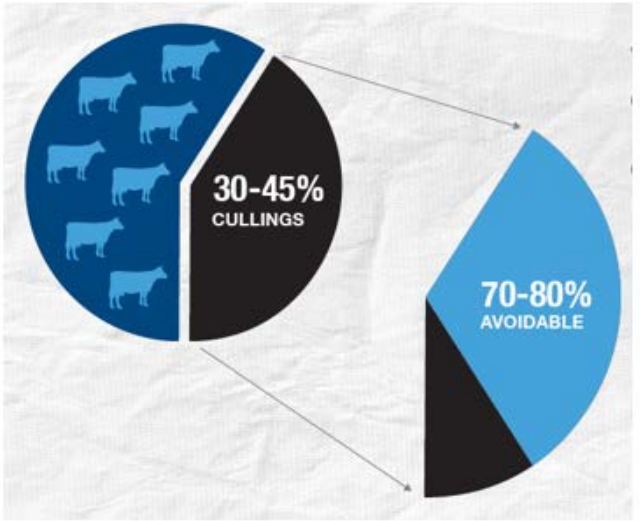
1. What are the main issues?
   - Causes and timing of wastage and health issues

2. What is the size of impact?
   - Productive effects
   - Economic costs

3. Where should we focus our efforts?
   - Targeted research

What do we know?





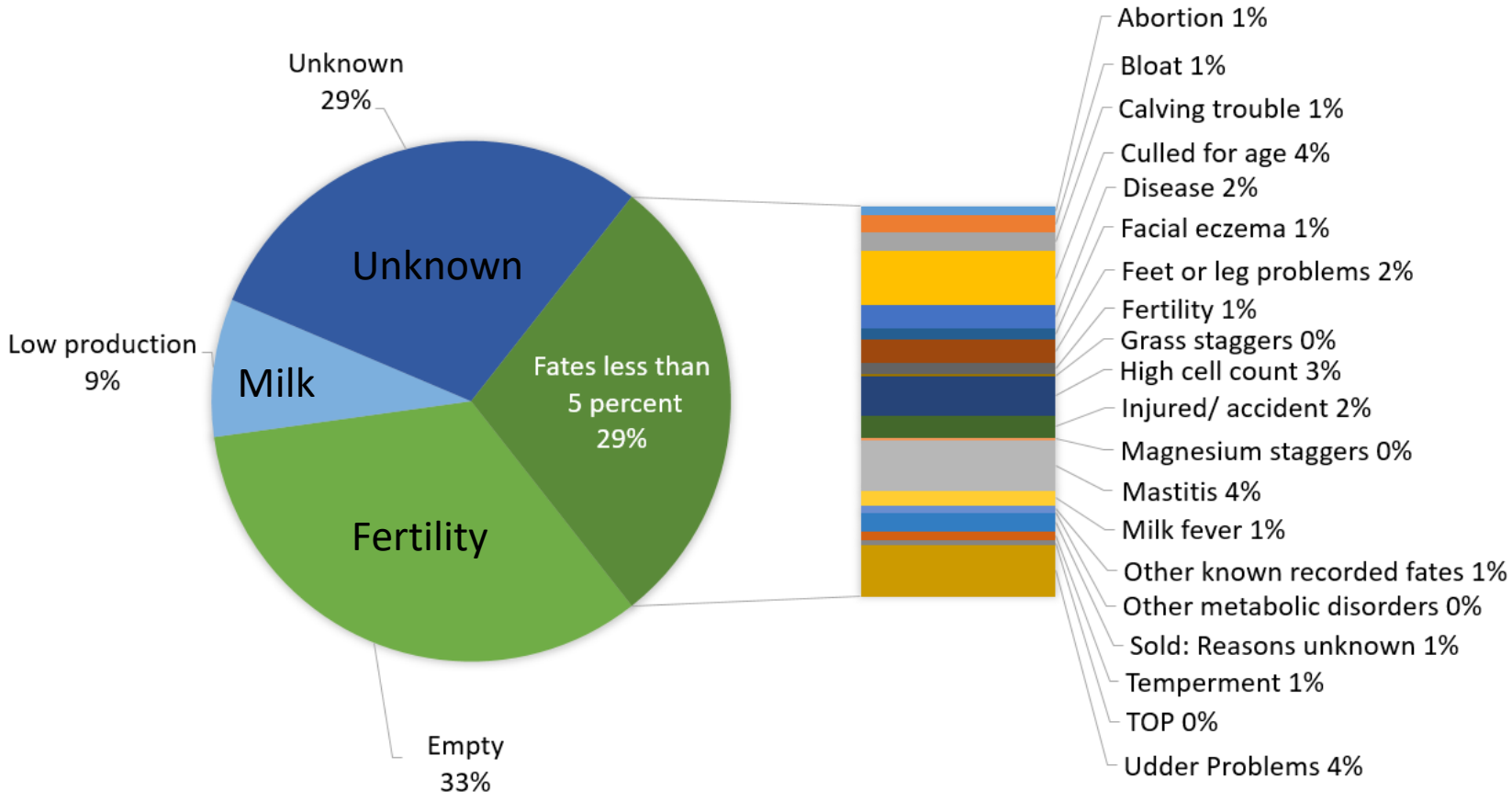
Source: www.delaval.com/HappyCows

- **NZ data**
  - 20-25% culling and 5% deaths
  - Need to dig deeper
  - Fertility large cause, but what else?
- **Overseas data (Canada)**
  - 30-45% culling and 6% deaths
  - Fertility large cause
  - Mastitis and lameness

How do we find the answers?

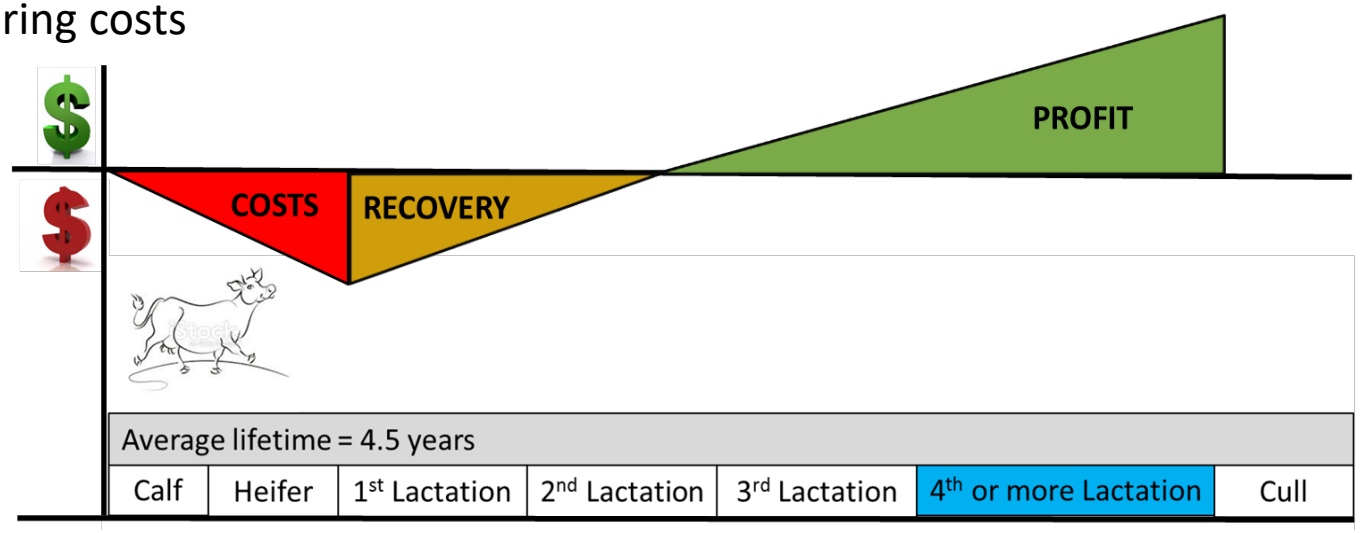
- Investigate large industry dataset
  - National dataset for genetic evaluation
  - National Herd Fertility Dataset – more detailed
- Challenges/limitations
  - Fate type and causes not well recorded
  - Survival is multi-factorial
  - Clinical and sub-clinical nature of health issues
- Possible to “Paint a Picture”
  - Reasons and timing (across parity and within lactation)

Recorded wastage reasons



What is **wastage** costing the industry?

- What is the cost-benefit of replacing a cow of a certain age?
  - Not a 1:1 relationship
- Bio-economic model
  - Age structure and profitability of a herd
  - Milk production, breeding worth and carcase salvage value
  - Vet and health treatments and wintering costs



Expected future lifespan

Parity (commenced)	Expected total parities remaining	Expected from replacement	Less reduced future
0			
1	4.2	4.2	0
2	4.1	4.2	-2.4%
3	3.9	4.2	-7.1%
:	:	:	:
6	2.9	4.2	-31%
:	:	:	:
8	1.9	4.2	-55%

Costs per cow for each parity

	Culled					Died on-farm
Parity	Replace cost	Carcase salvage	Production loss	Genetic merit change	∑ cost/cow lost	∑ costs/cow lost
n	€	€	€	€	€	€
1	837.12	-279.04				
2	805.12	-314.88				
3	687.36	-285.44				
4	648.96	-275.2				
5	574.72	-248.32				
6	498.56	-215.04				
7	418.56	-181.12				
8	377.6	-163.2				
9+	308.48	-133.12				

Costs per cow for each parity

	Culled					Died on-farm
Parity	Replace cost	Carcase salvage	Production loss	Genetic merit change	∑ cost/cow lost	∑ costs/cow lost
n	€	€	€	€	€	€
1	837.12	-279.04	256			
2	805.12	-314.88	376.32			
3	687.36	-285.44	356.48			
4	648.96	-275.2	336.64			
5	574.72	-248.32	298.24			
6	498.56	-215.04	258.56			
7	418.56	-181.12	216.96			
8	377.6	-163.2	195.84			
9+	308.48	-133.12	160			

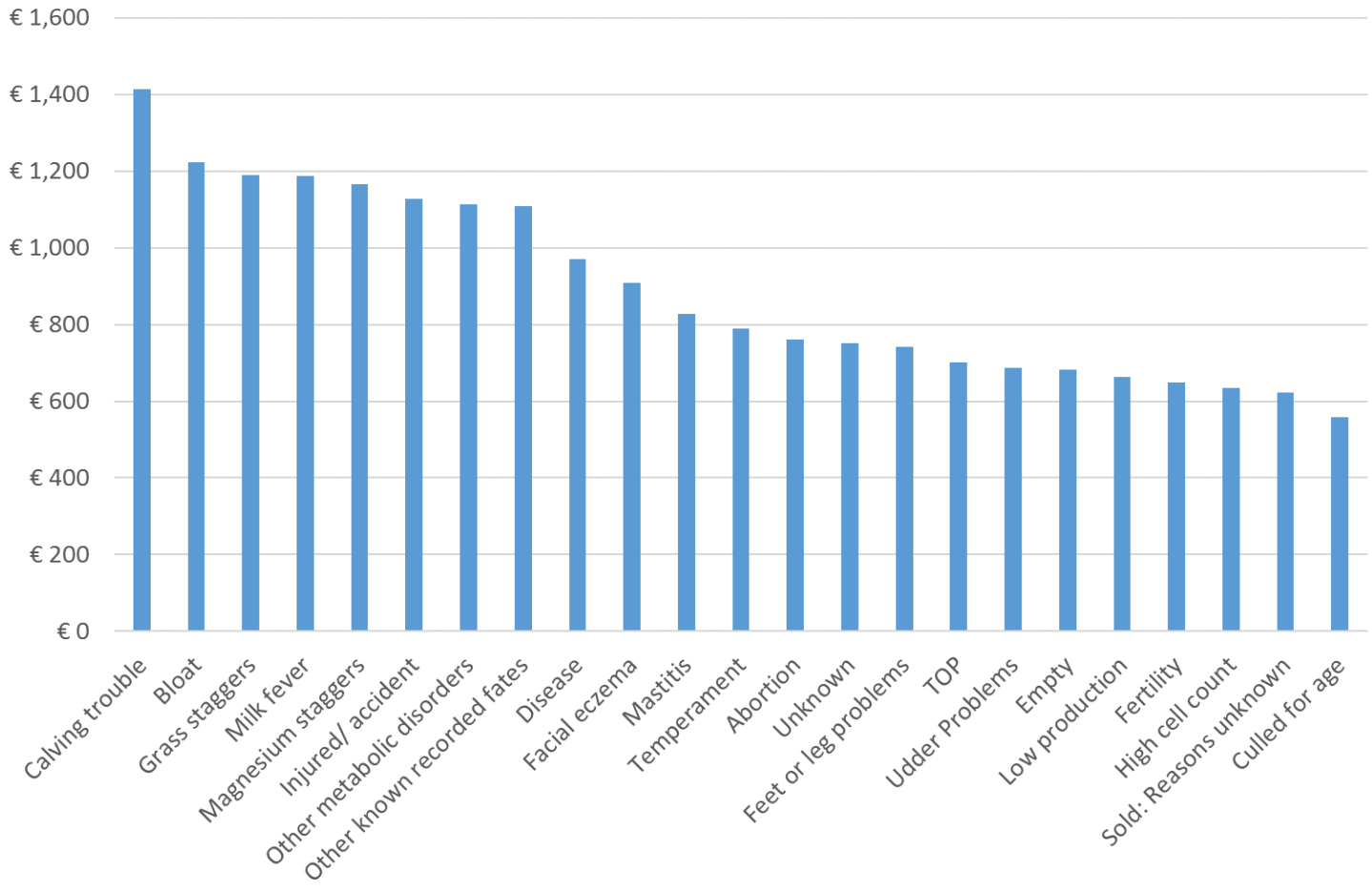
Costs per cow for each parity

	Culled					Died on-farm
Parity	Replace cost	Carcase salvage	Production loss	Genetic merit change	∑ cost/cow lost	∑ costs/cow lost
n	€	€	€	€	€	€
1	837.12	-279.04	256	-20.48		
2	805.12	-314.88	376.32	-39.68		
3	687.36	-285.44	356.48	-49.92		
4	648.96	-275.2	336.64	-63.36		
5	574.72	-248.32	298.24	-69.76		
6	498.56	-215.04	258.56	-72.32		
7	418.56	-181.12	216.96	-71.04		
8	377.6	-163.2	195.84	-73.6		
9+	308.48	-133.12	160	-67.2		

Costs per cow for each parity

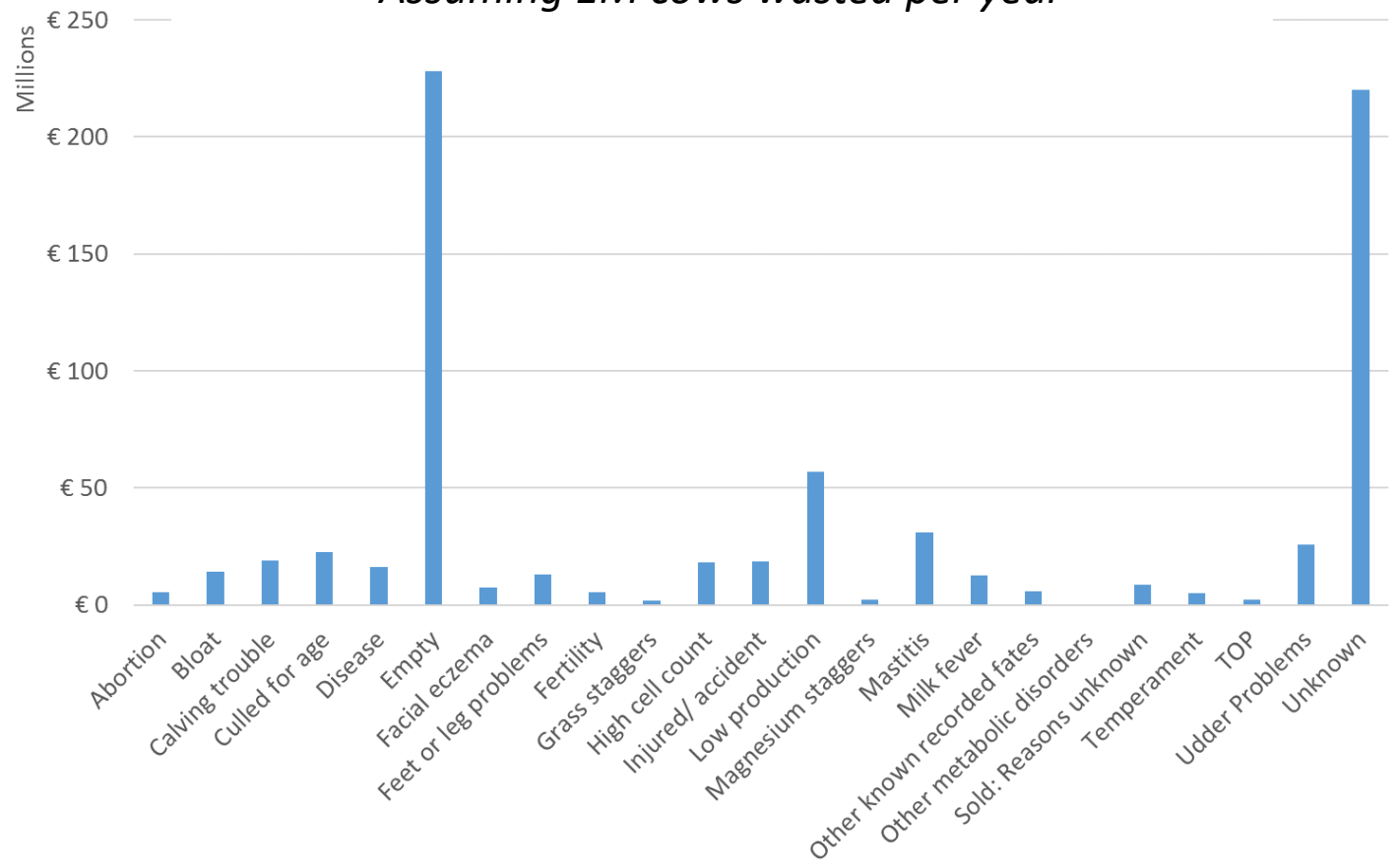
	Culled					Died on-farm
Parity	Replace cost	Carcase salvage	Production loss	Genetic merit change	∑ cost/cow lost	∑ costs/cow lost
n	€	€	€	€	€	€
1	837.12	-279.04	256	-20.48	792.96	1114.24
2	805.12	-314.88	376.32	-39.68	826.88	1204.48
3	687.36	-285.44	356.48	-49.92	708.48	1109.12
4	648.96	-275.2	336.64	-63.36	641.28	1053.44
5	574.72	-248.32	298.24	-69.76	554.88	967.04
6	498.56	-215.04	258.56	-72.32	469.12	881.28
7	418.56	-181.12	216.96	-71.04	384	796.16
8	377.6	-163.2	195.84	-73.6	336	748.16
9+	308.48	-133.12	160	-67.2	267.52	679.68

Costs per cow for each fate



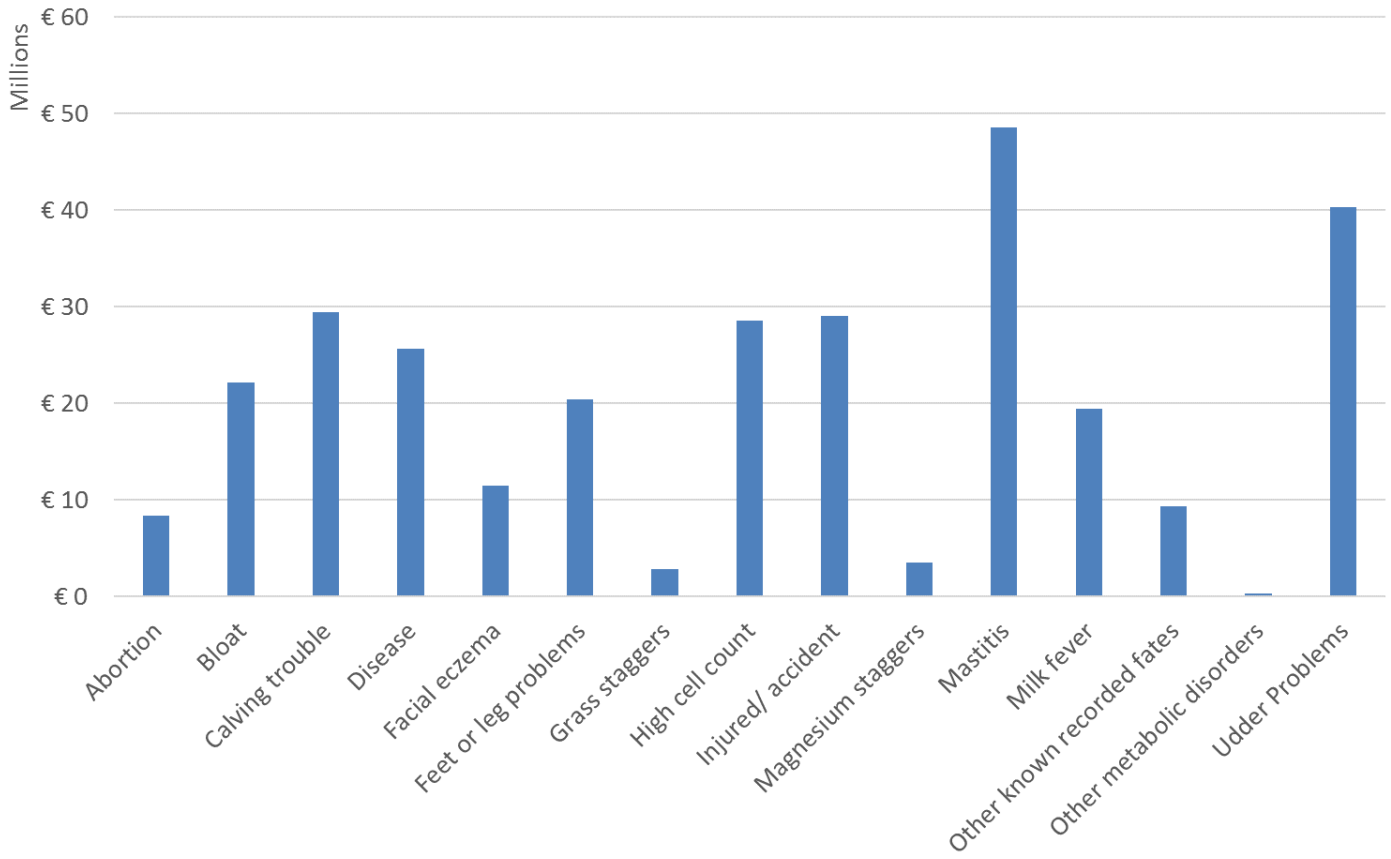
Estimate cost for industry: €768M

Assuming 1M cows wasted per year



Estimate cost for industry: €188.8M

If empty, unknown and voluntary reasons not included



What are **health issues** costing the industry?

 # Cows x milk production loss

- Before and after diagnosis
- Shorter lactation lengths

 # Cases x health treatment

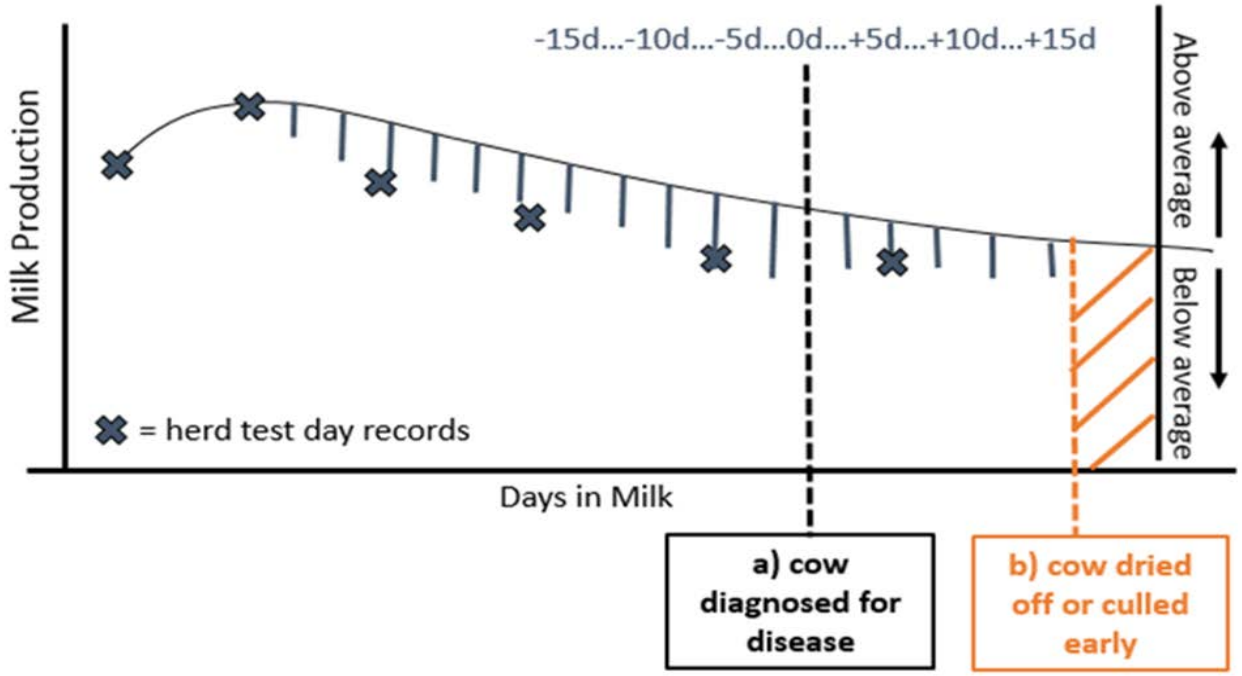
- Vet and farmer labour
- Drugs

Reproductive performance

- Longer calving interval
- Failure to get into calf

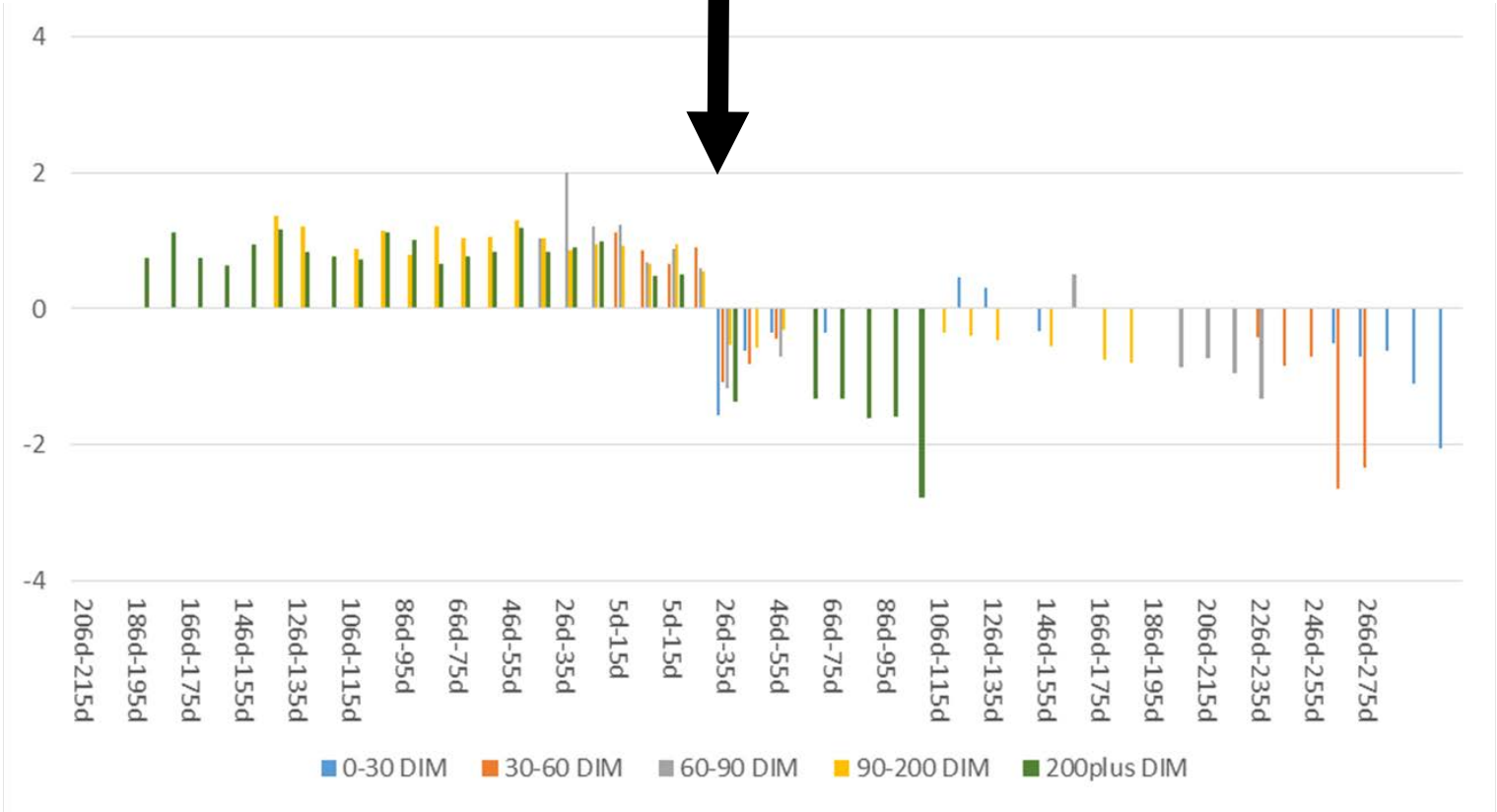
Milk production loss

A. Loss before and after recorded diagnosis
B. Days in milk lost from dried off or culled early



Mastitis and lame adj.

- Higher than average MP before diagnosis
  - MP before diagnosis x days left in lactation + average MP loss after
  - Not carried out for other disorders



Economic impacts of health events on milk losses and **cow survival**

	Health event	Milk lost (L)	Milk value (€)	Reduced survival	Reduced survival value (€)	Total per case (€)
Foot	Lameness	-116.3	-30.9			-30.9

Economic impacts of health events on milk losses and **cow survival**

	Health event	Milk lost (L)	Milk value (€)	Reduced survival	Reduced survival value (€)	Total per case (€)
Foot	Lameness	-116.3	-30.9			-30.9
Mastitis/Udder	Clinical mastitis	-189.2	-50.2	-4%	-27.7	-77.9
Mastitis/Udder	Subclinical mastitis	-433.4	-115.0			-115.0
Mastitis/Udder	Udder disorder	-945.5	-251.0			-251.0

Economic impacts of health events on milk losses and **cow survival**

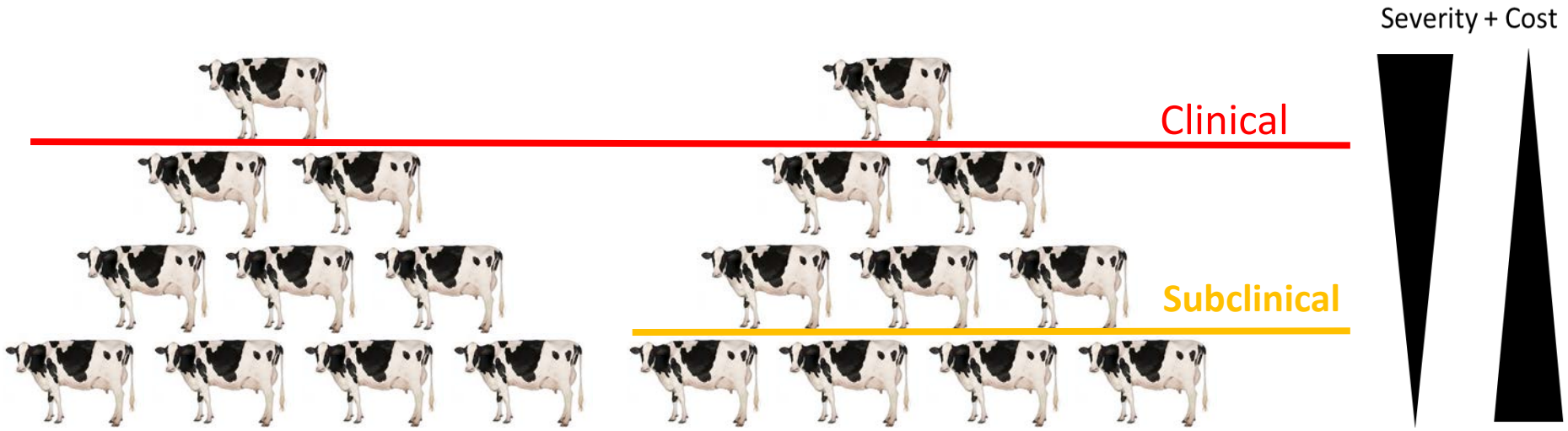
	Health event	Milk lost (L)	Milk value (€)	Reduced survival	Reduced survival value (€)	Total per case (€)
Foot	Lameness	-116.3	-30.9			-30.9
Mastitis/Udder	Clinical mastitis	-189.2	-50.2	-4%	-27.7	-77.9
Mastitis/Udder	Subclinical mastitis	-433.4	-115.0			-115.0
Mastitis/Udder	Udder disorder	-945.5	-251.0			-251.0
Metabolic	Milk fever	-18.1	-4.8			-4.8
Metabolic	Other metab.	-171.9	-45.6			-45.6
Other	Other ailments	-350.9	-93.2	-7%	-53.9	-147.1
Other	Parasites	-376.7	-100.0			-100.0
Post-partum	Retained fetal membranes	-70.4	-18.7	-8%	-54.3	-72.9
Post-partum	Uterine infection	-93.0	-24.7	-7%	-51.3	-76.0
Reproductive	Calving problems	-258.6	-68.6	-13%	-88.5	-157.1
Reproductive	Calving induction	-96.2	-25.5			-25.5
Reproductive	Anestrus	-15.2	-4.0	-3%	-24.7	-28.7
Reproductive	Reproductive disorders	-136.8	-36.3			-36.3

Estimated industry costs for health issues

- Assumes 4.9M cows in NZ
- Assumes €2.96 per kg milk solids
  (based on marginal economic value for fat and protein)

Disease	Milk Production loss (€)	Treatment (€)	Total (€)
Foot	26.5M	27.0M	53.6M
Mastitis/Udder	75.8M	51.6M	127.5M
Metabolic	3.8M	5.9M	9.7M
Post-partum	10.6M	8.5M	13.8M
Other	7.8M	9.0M	22.1M
Total	**124.5M**	**101.9M**	**226.6M**

What about the cows that are not treated?



Subclinical costs?

- Broad assumptions
  - Clinical : subclinical ratio

Disease	Cases		Industry cost		Total
	SC:C	n/cow	SC:C	€/case	€
Foot	1.5		0.5		
Mastitis	3.0		0.5		
Metabolic	3.0		0.5		
Post-partum	3.0		0.5		
Other	3.0		0.5		
Total					

Subclinical costs?

- Broad assumptions
  - Clinical : subclinical ratio

Disease	Cases		Industry cost		Total
	SC:C	n/cow	SC:C	€/case	€
Foot	1.5	0.120	0.5	68.5	40.2M
Mastitis	3.0	0.494	0.5	78.7	190.7M
Metabolic	3.0	0.052	0.5	57.0	14.5M
Post-partum	3.0	0.082	0.5	51.2	20.6M
Other	3.0	0.064	0.5	105.0	33.2M
Total					299.5M

Estimated costs for wastage and health issues

- Wastage costs
  - Total industry costs estimated at €770M
  - Remove empty and unknown reasons' costs - estimated to be €188.8M
  - 8 reasons > €12.8M/year

- Health issue costs
  - Estimated costs for recorded health disorder effects on:
    - milk production loss and treatment were €227M
    - reproduction were €114M
  - Estimated costs for subclinical were €299.5M
    - Broad assumptions used

Next challenges?

- Of the €770M, what can be realistically saved?
  - What should the benchmark targets be?
  - Where are the biggest gains to be made?

- Lack of recording makes it difficult to assess or foresee issues
  - What data is most valuable for industry?
    - Causes versus timing?
    - 74 fate causes and 82 health disorders?
  - What can we do with it to “give back” to farmers?
    - Short and long term

Acknowledgements

- This work is funded by:
  - Ministry of Business, Innovation and Employment
  - New Zealand dairy farmers through DairyNZ Inc.

- Data was provided by LIC

- Additional information and support provided by DairyNZ and the wider Lifetime Productivity Team (Massey University, Cognosco and Vet South)