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UNIVERSITY

DEPARTMENT OF AGROECOLOGY

# Average milk yield per feeding day during extended lactations

Jesper Overgård Lehmann  
PhD Fellow

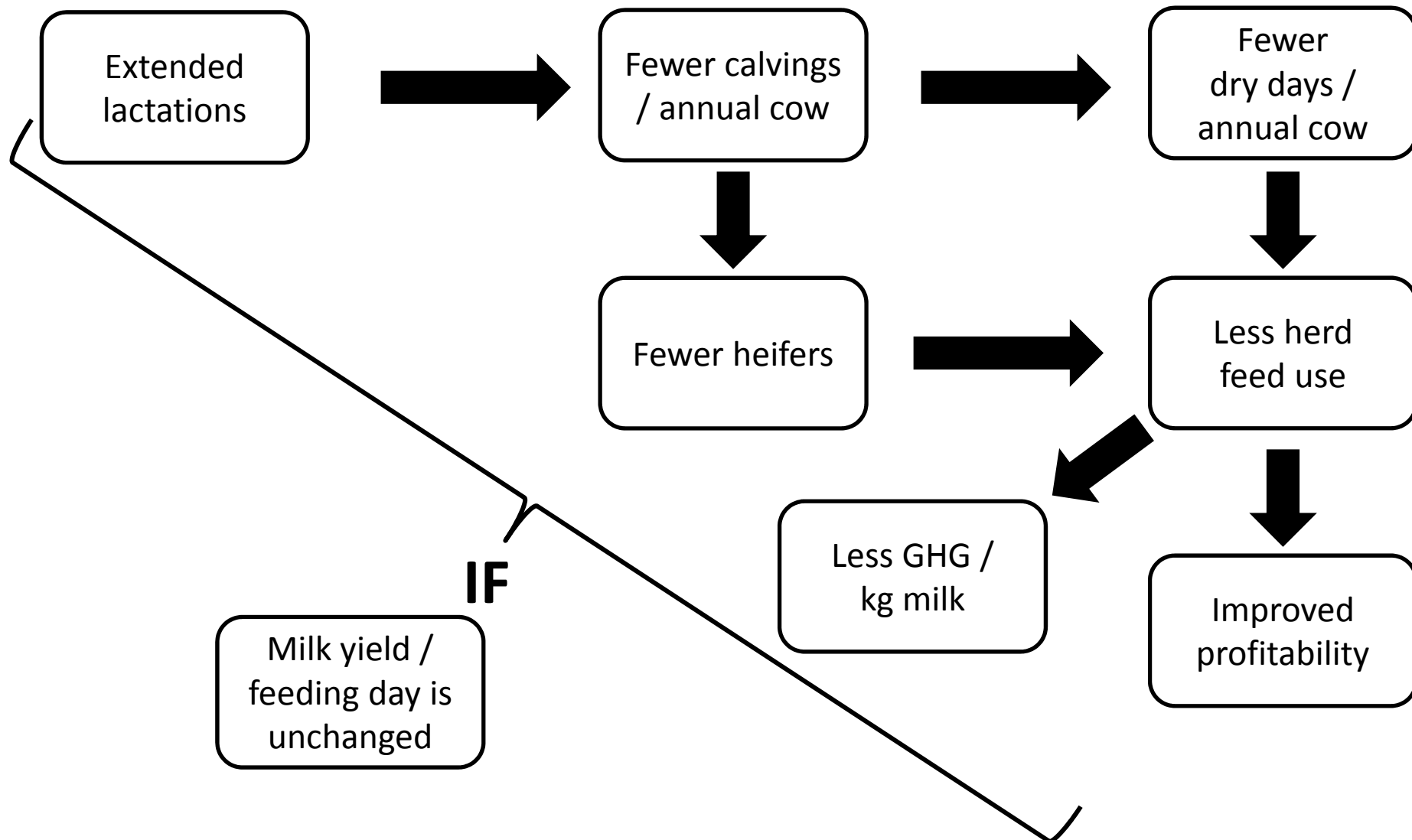
E-mail: [JesperO.Lehmann@agrsci.dk](mailto:JesperO.Lehmann@agrsci.dk)

With contributions from Lisbeth Mogensen and Troels Kristensen, AU  
With help from Ermias Kebreab and Jim Fadel, UC Davis, California

# Outline of presentation

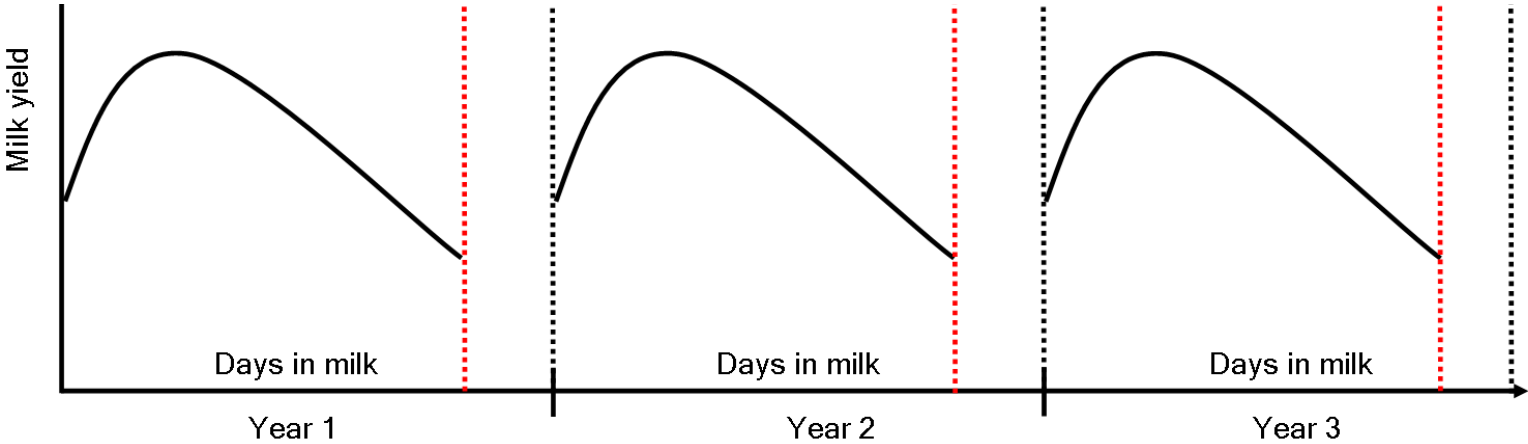
- Why extended lactations?
- Private herds with extended lactations
- Fitting sparse milk recordings
- Extended lactation curves
- Results
- Key points

# The logic behind extended lactation

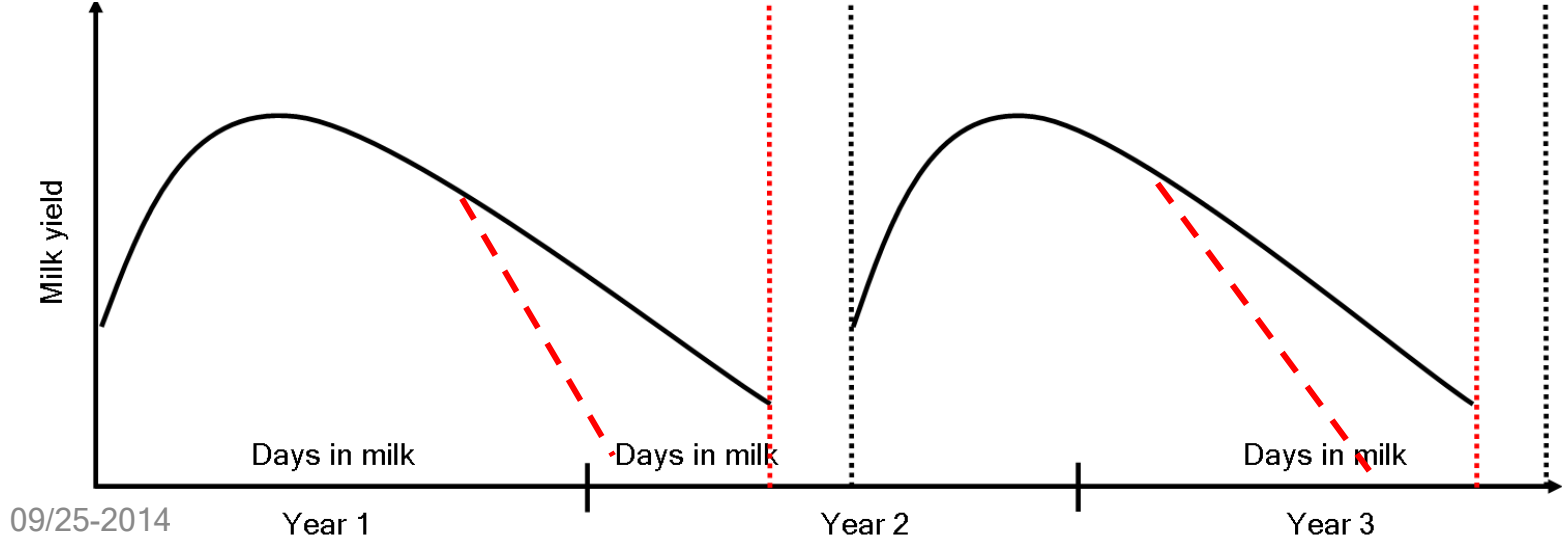


# Lactation curves

Traditional lactations - app. 12-month calving interval



Extended lactations - app. 18-month calving interval

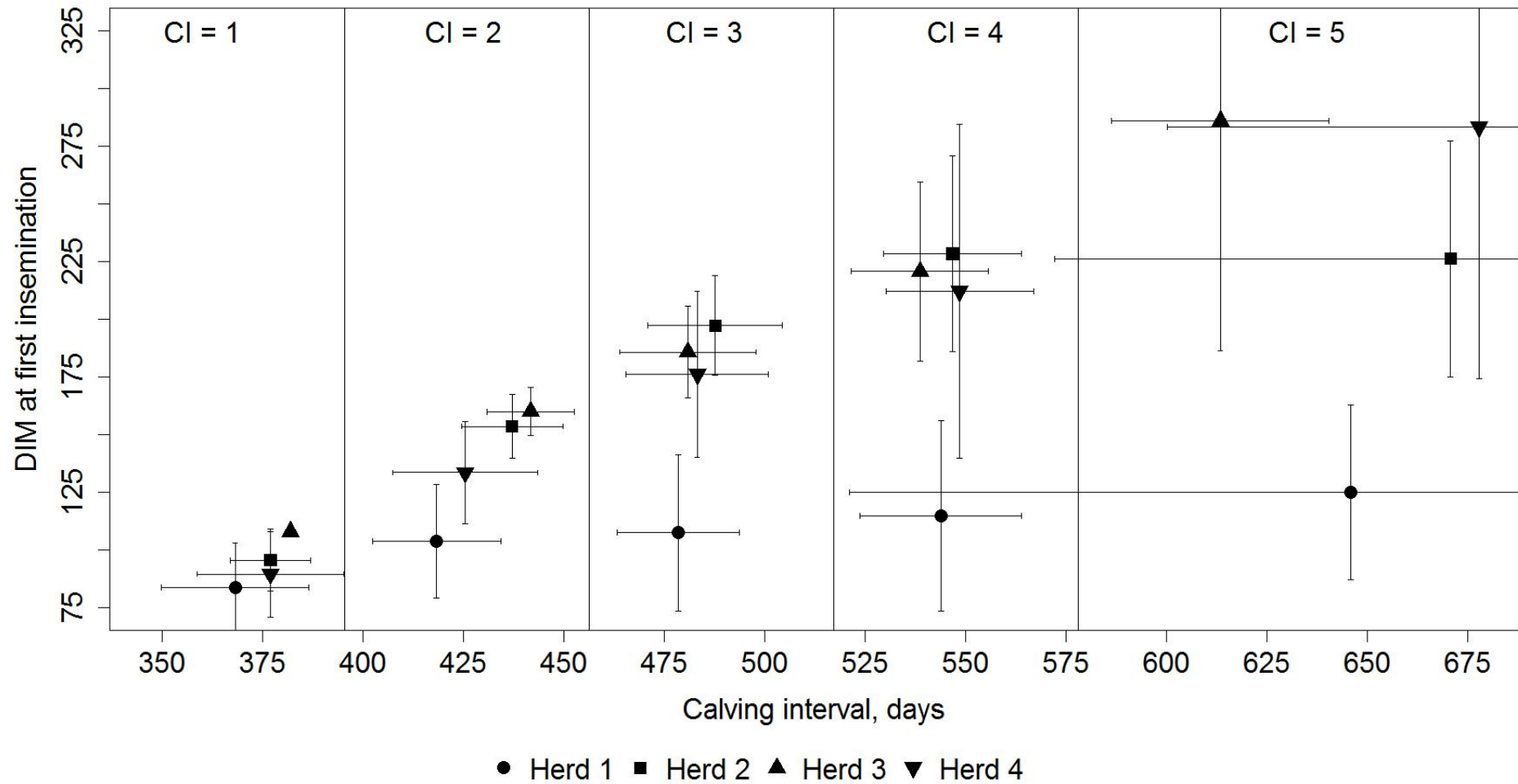


# Private herds with extended lactations

Herd characteristic	Herd 1	Herd 2	Herd 3	Herd 4
No of cows	162	93	158	112
Breed	Holstein	Holstein	Cross	Jersey
ECM / cow / year	11,274	10,099	7,669	7,090
Replacement, %	40	25	42	23
Milking system	Parlour - 3x	Robot	Parlour - 2x	Robot
Grazing	No	Yes	Yes	Yes

- ECM recordings: Jan 2007 - May 2013
- 1,320 completed lactations

# Days to first insemination



# Fitting sparse milk recordings

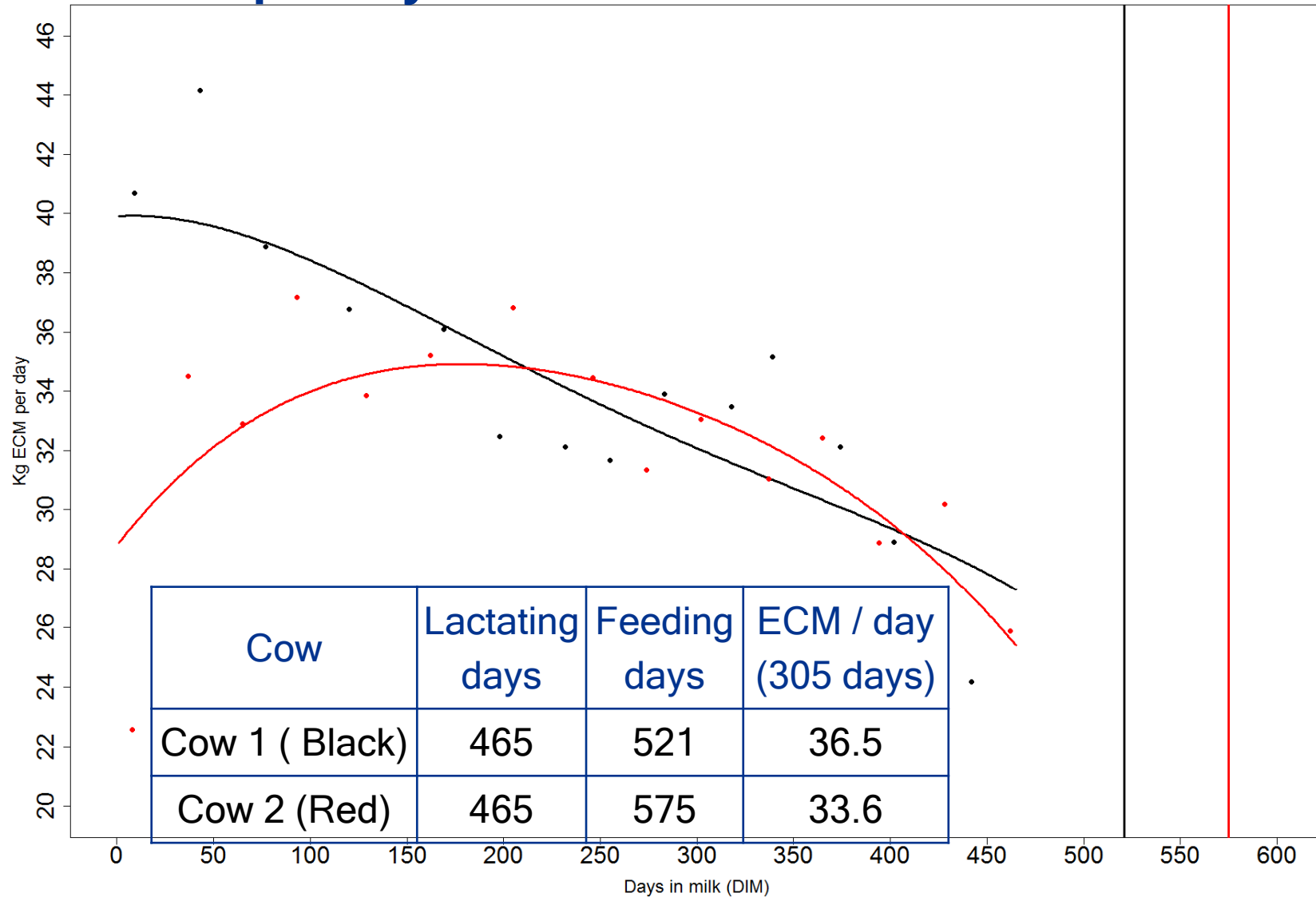
## Considerations

- Aim - total yield, peak
- Distance between record
- Management variation
- Calving interval
- Disease effect
- Incomplete lactations
- Drying off
- Milk yield at day one

## Standard methods

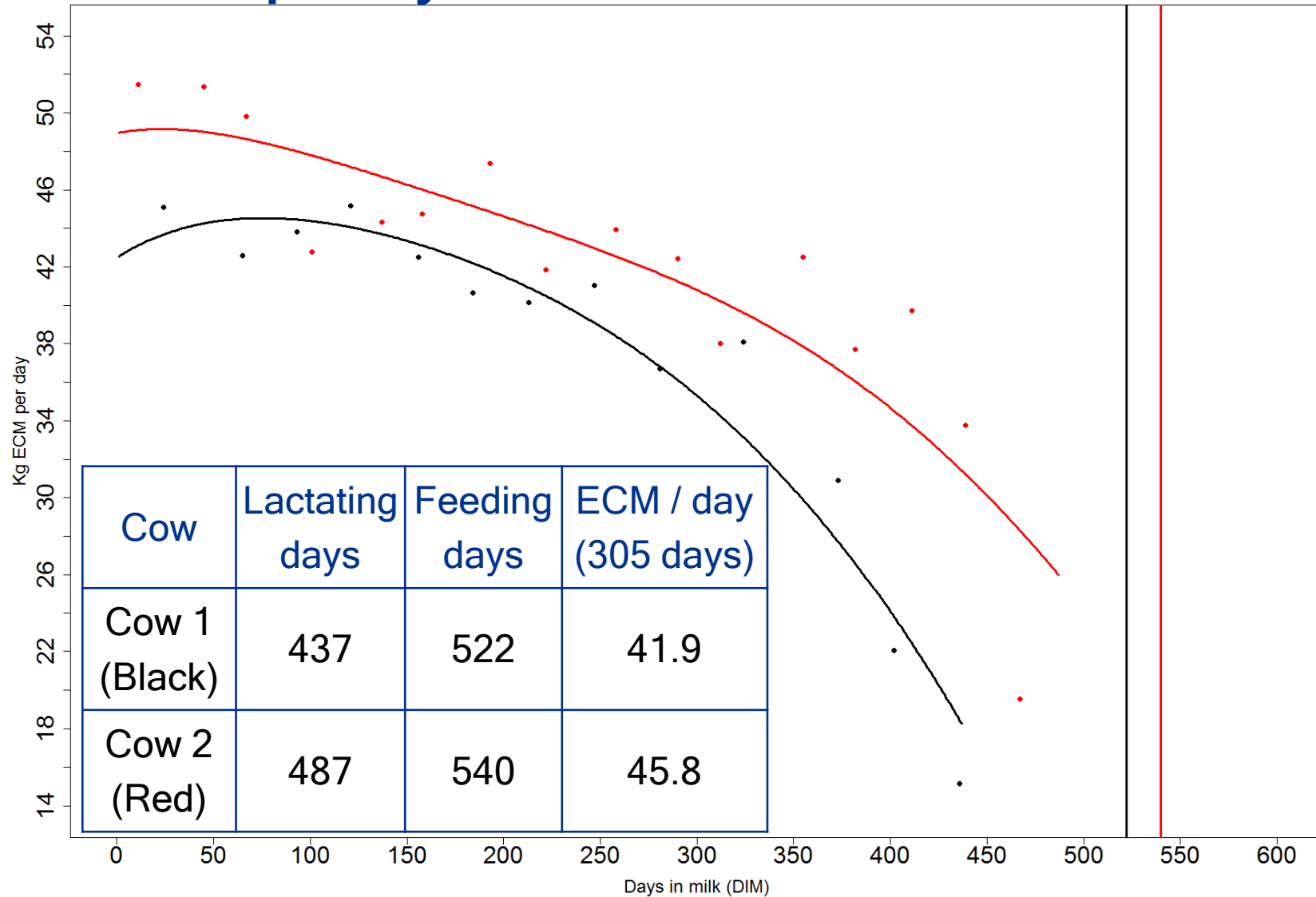
Type	# par	Reference
Logarithmic	2	Brody, 1923
Incompl. Gamma	3	Wood, 1967
Exp. + linear	4	Wilmink, 1987
Mech. diff. eq.	5	Dijkstra, 1997
Legendre Polyn	-	Schaeffer, 1990
...	...	...

# First parity lactation curves - Herd 1

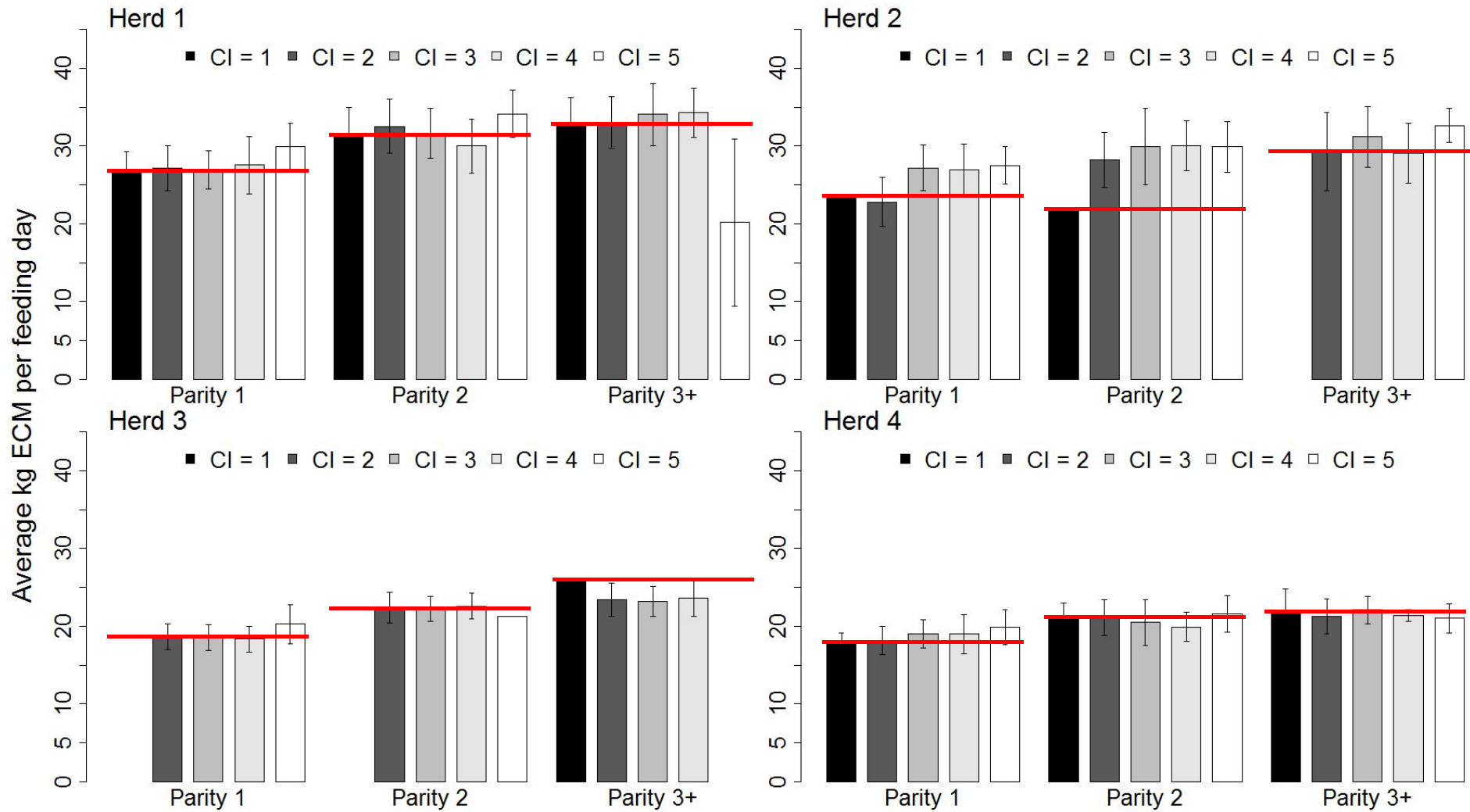




# Third parity lactation curves - Herd 1



# Mean kg ECM per feeding day



# Kg ECM per feeding day, mean $\pm$ sd

		Parity 1					Parity 3+				
CI	< 13	13 < 15	15 < 17	17 < 19	19 <	< 13	13 < 15	15 < 17	17 < 19	19 <	
Herd 1	26.8 $\pm$ 2.5	27.1 $\pm$ 2.9	26.9 $\pm$ 2.5	27.6 $\pm$ 3.7	29.9 $\pm$ 3.0	32.9 $\pm$ 3.3	33.0 $\pm$ 3.4	34.1 $\pm$ 4.0	34.3 $\pm$ 3.2	20.2 $\pm$ 10.8	
	(n = 124)	(n = 75)	(n = 21)	(n = 8)	(n = 9)	(n = 53)	(n = 32)	(n = 10)	(n = 6)	(n = 2)	
Herd 3	NA $\pm$ NA (n = 0)	18.7 $\pm$ 1.7	18.5 $\pm$ 1.6	18.3 $\pm$ 1.7	20.3 $\pm$ 2.6	26.1 $\pm$ NA (n = 1)	23.4 $\pm$ 2.1	23.2 $\pm$ 1.9	23.6 $\pm$ 2.4	NA $\pm$ NA (n = 0)	
		(n = 105)	(n = 82)	(n = 18)	(n = 2)		(n = 60)	(n = 56)	(n = 5)		

# Key points

- Extended lactations may reduce herd feed use without reducing herd milk production
- Results from four Danish dairy farms suggest that milk yield per feeding can be maintained
- Future work will attempt to characterize cows capable of maintaining milk yield
- Future work will estimate overall farm effect on GHG emission and farm economy

Reference: Lehmann et al. Organic Agriculture. Available online: July 16<sup>th</sup> 2014