Persistency of lactation yields of milk, fat and protein in New Zealand dairy goats

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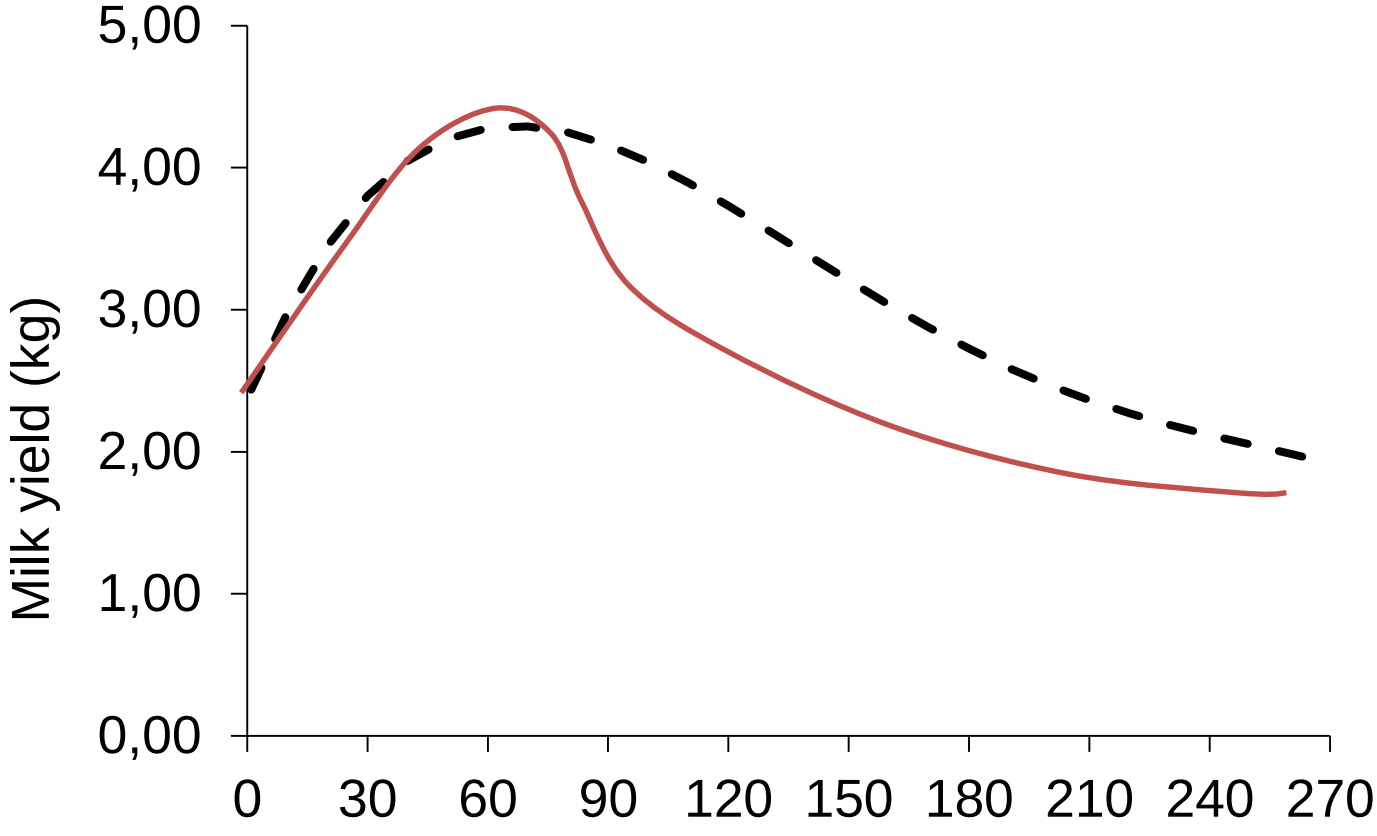
Milk production

Average daily yield

Total lactation yield



Lactation curve

Scale of production

Dietary needs

Health

Objective

Describe the lactation curves of daily yields of milk, fat and protein in New Zealand dairy goats

Data

Original data set

- 304,648 herd-test records

- 48,113 does from 55 herds

- Kidding between 2010 – 2016

- Alpine, Nubian, Saanen, Toggenburg and crossbred

Data cleaning

- Herds were removed

  >20% of animals had unknown sires

- Contemporary groups (herd-test-day) were removed

  <10 herd-tested does

Data

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Final data set

- 113,895 herd-test records

- 14,187 does from 11 herds

- Saanen, crossbred, ANT (Alpine, Nubian and Toggenburg)

Model

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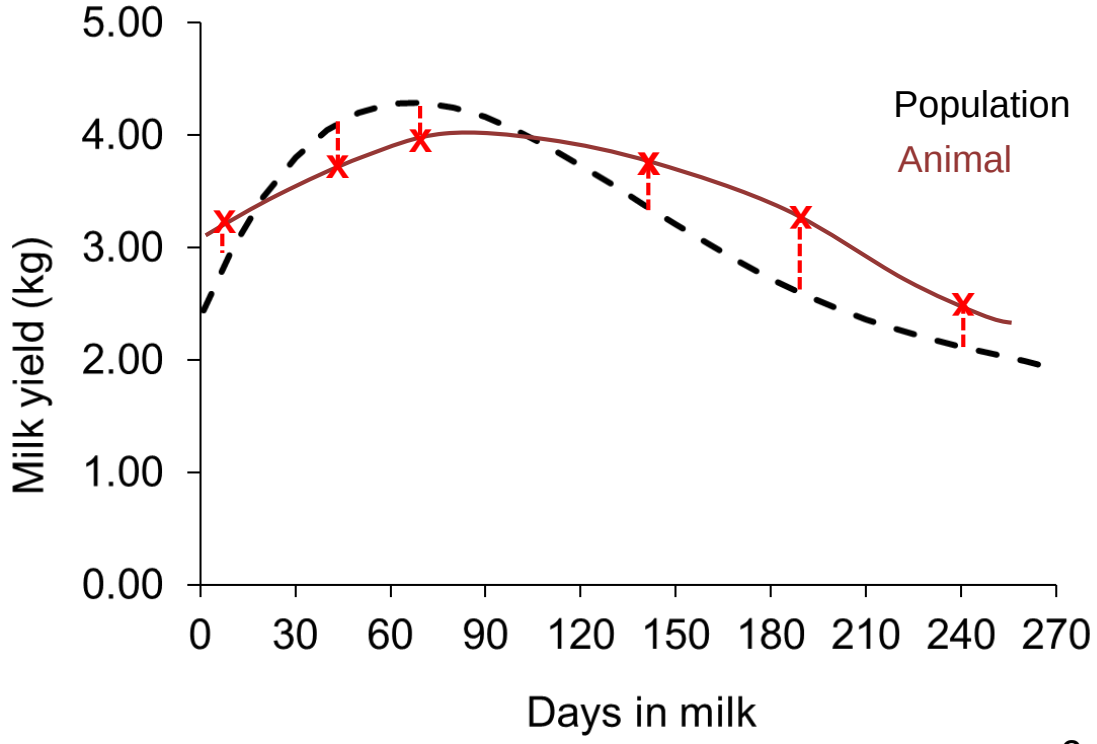
Lactation curves

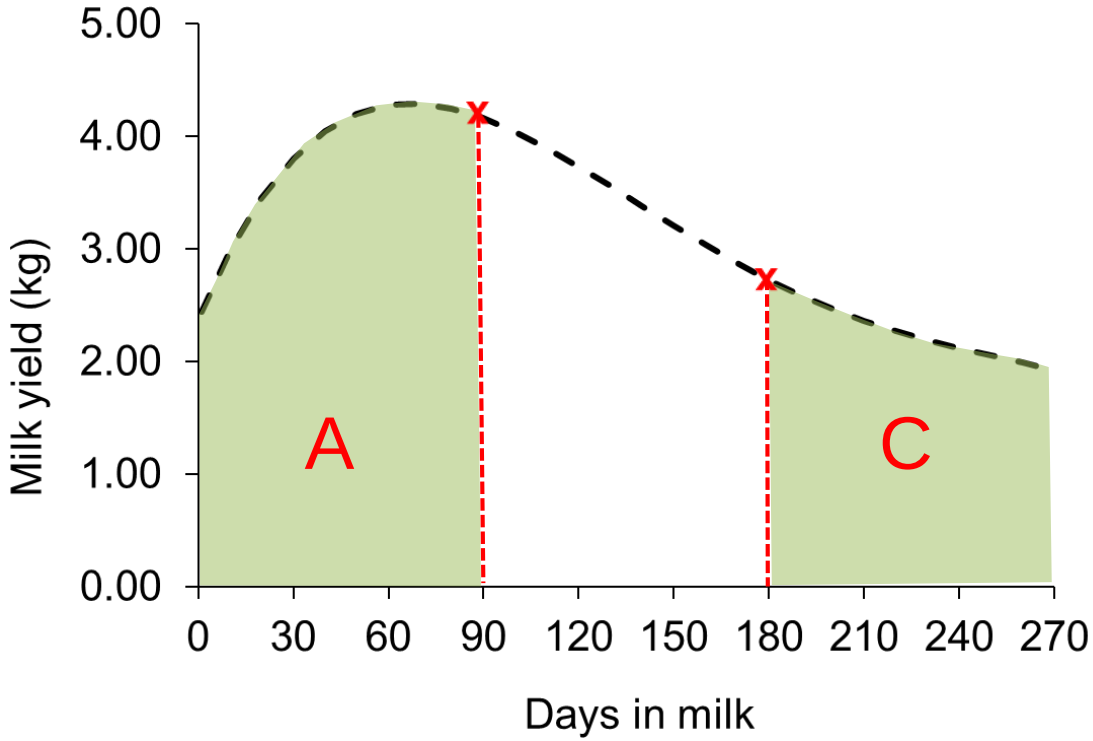
- Test-day random regression model in ASReml
- Random effect of animal-lactation (3rd order pol)
- Unstructured covariance matrix

Total 270-d yield | Peak daily yield | Day of peak yield | Persistency

- Linear model in SAS
- Fixed effects
  - » Breed group (Saanen or crossbred)
  - » Parity
  - » Breed*Parity
- Covariates
  - » Deviation from median kidding date
- Random effects
  - » Herd-year



Persistency



$$\text{Persistency} = \frac{C}{A} \times 100$$

Descriptive statistics

		Milk yield (kg)			Fat yield (kg)			Protein yield (kg)		
	n	Mean	SD[1]	CV[2]	Mean	SD[1]	CV[2]	Mean	SD[1]	CV[2]
Population	36,241	894.7	224.4	25	30.60	8.85	29	28.24	7.99	28
Parity										
1	10,386	757.6	170.8	23	25.32	7.15	28	23.21	6.27	27
2	9,005	935.9	204.2	22	32.48	8.31	26	29.77	7.29	24
3	5,938	996.2	223.3	22	34.46	8.71	25	31.95	7.76	24

3.3 kg/day

2.8 kg/day

3.7 kg/day

[1]SD = standard deviation. [2]CV = coefficient of variation.

Lactation curves

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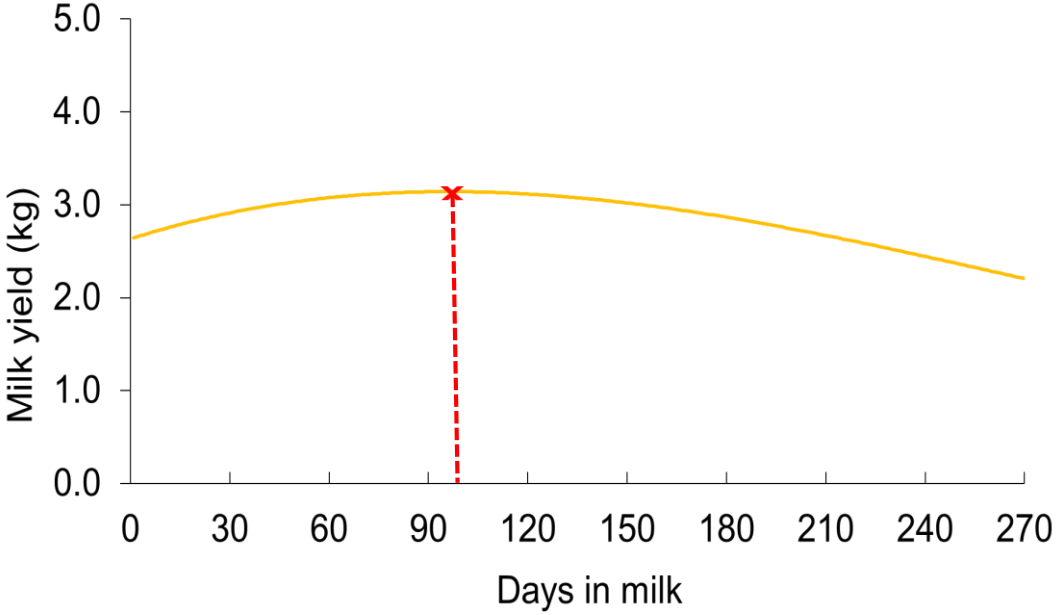
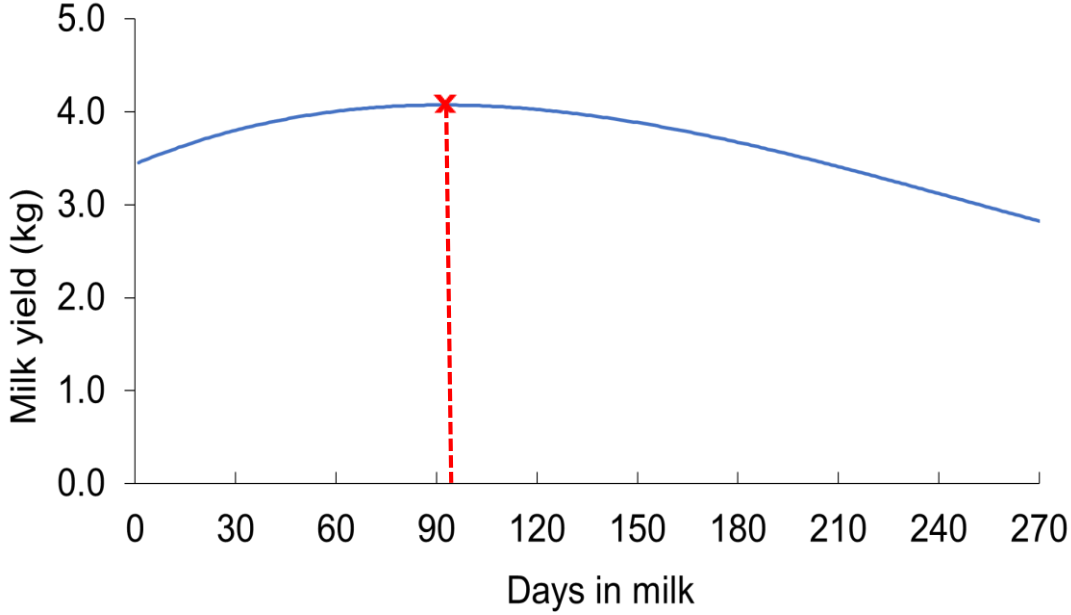
Parity 1

Peak yield	3.1 kg
Day of peak	95
270-day yield	757.6 kg
Persistency	85.2%



Parity 3

Peak yield	4.1 kg
Day of peak	92
270-day yield	996.2 kg
Persistency	84.2%



Lactation curves

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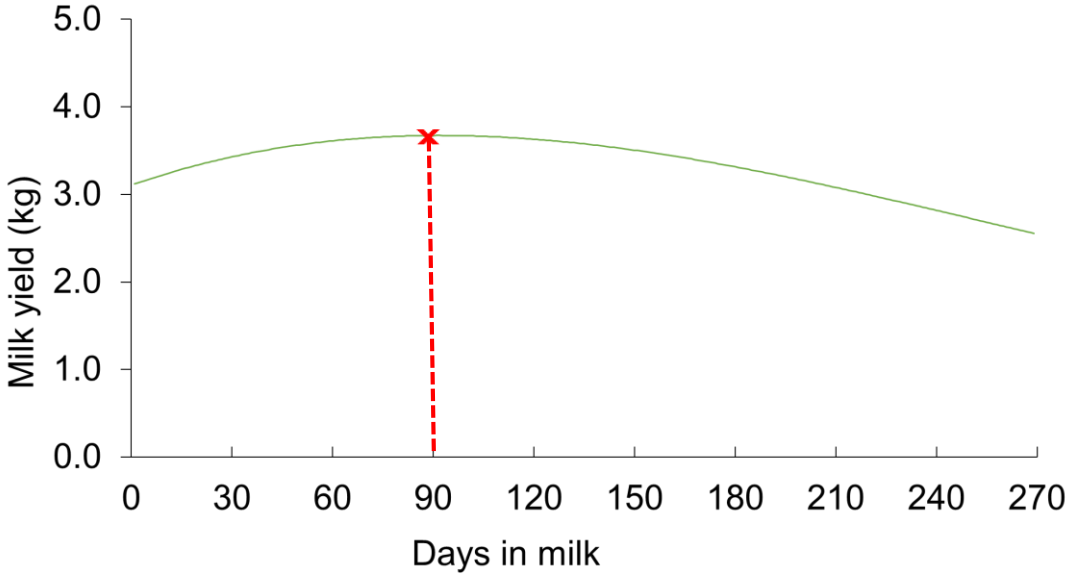
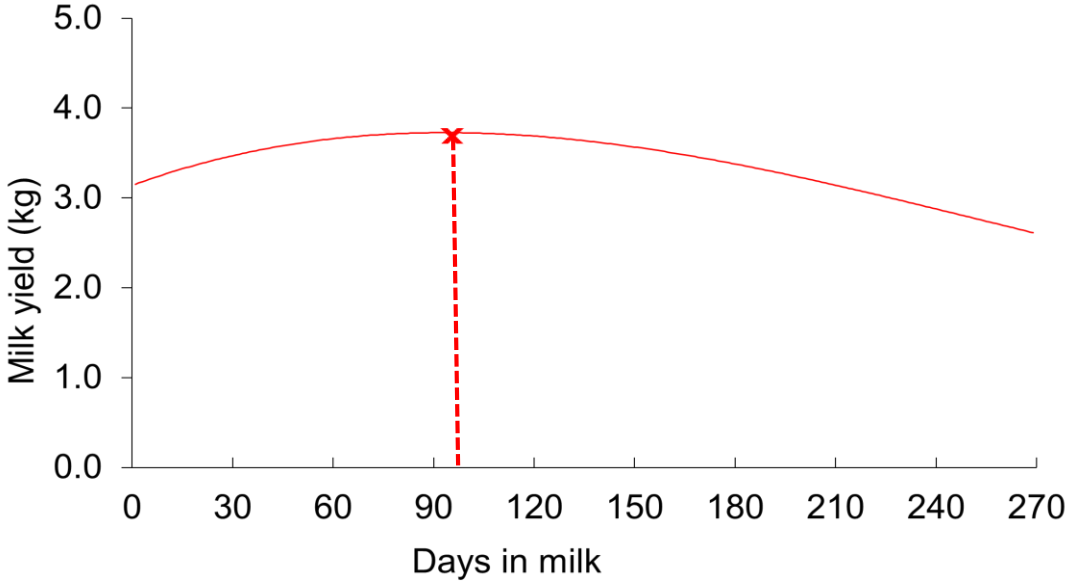
Saanen

Peak yield	3.6 kg
Day of peak	90
270-day yield	884.1 kg
Persistency	83.4%



Crossbred

Peak yield	3.7 kg
Day of peak	93
270-day yield	895.9 kg
Persistency	84.4%



Phenotypic correlations

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Milk yield

	270-day yield	Peak yield	Day of peak	Persistency
270-day yield				
Peak yield	1.00			
Day of peak	0.25	0.19		
Persistency	0.26	0.19	0.95	

Summary

- New Zealand dairy goats have high persistency

- Encouraging for farmers thinking about extended lactations

Acknowledgements

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Dairy Goat Co-operative

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MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HIKINA WHAKATUTUKI

Questions

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Extras

Descriptive statistics

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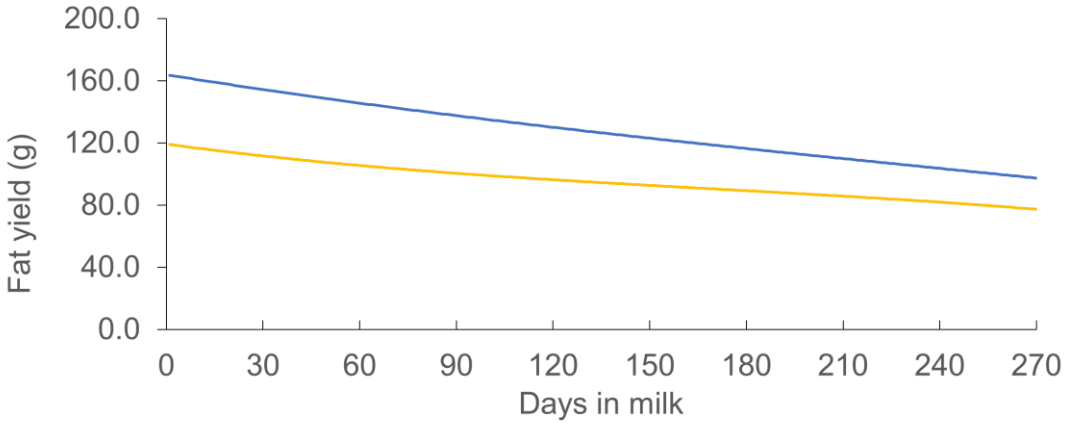
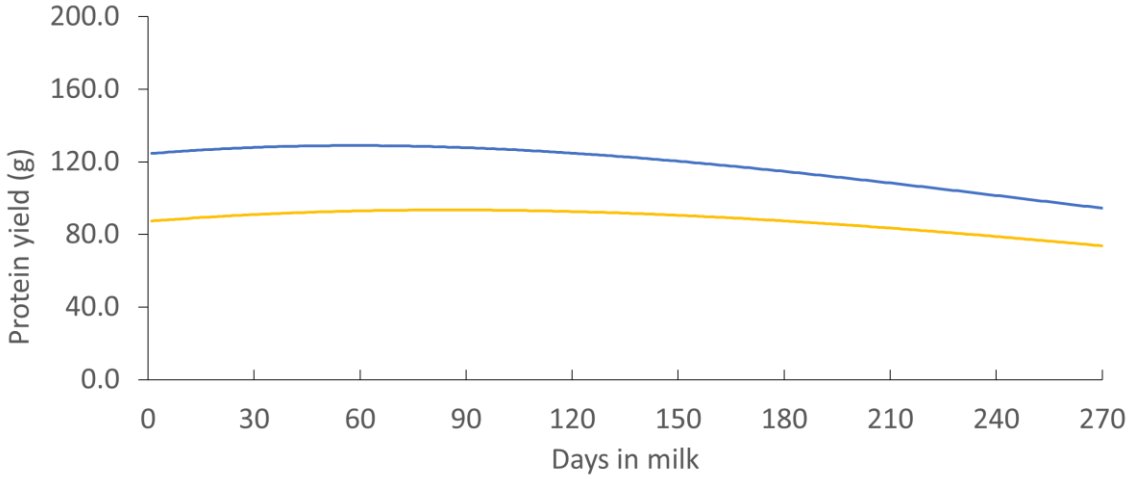
2	9,005	935.9	204.2	22	32.48	8.31	26	29.77	7.29	24
3	5,938	996.2	223.3	22	34.46	8.71	25	31.95	7.76	24
Breed										
Saanen	3,006	884.1	226.2	26	30.50	9.18	30	28.07	8.34	30
Crossbred	33,183	895.9	224.2	25	30.61	8.82	29	28.26	7.96	28

[1]SD = standard deviation. [2]CV = coefficient of variation.

Lactation curves

Parity 1 Parity 3





Correlations

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Milk

	270-day yield	Peak yield	Day of peak	Persistency
270-day yield				
Peak yield	1.00			
Day of peak	0.25	0.19		
Persistency	0.26	0.19	0.95	

Fat

	270-day yield	Peak yield	Day of peak	Persistency
270-day yield				
Peak yield	0.87			
Day of peak	0.03	-0.18		
Persistency	0.01	-0.39	0.60	

Protein

	270-day yield	Peak yield	Day of peak	Persistency
270-day yield				
Peak yield	0.94			
Day of peak	0.08	-0.09		
Persistency	0.03	-0.16	0.78	