THE KEY TO TRANSITION SUCCESS

PIETER PASSCHYN, DVM, PhD

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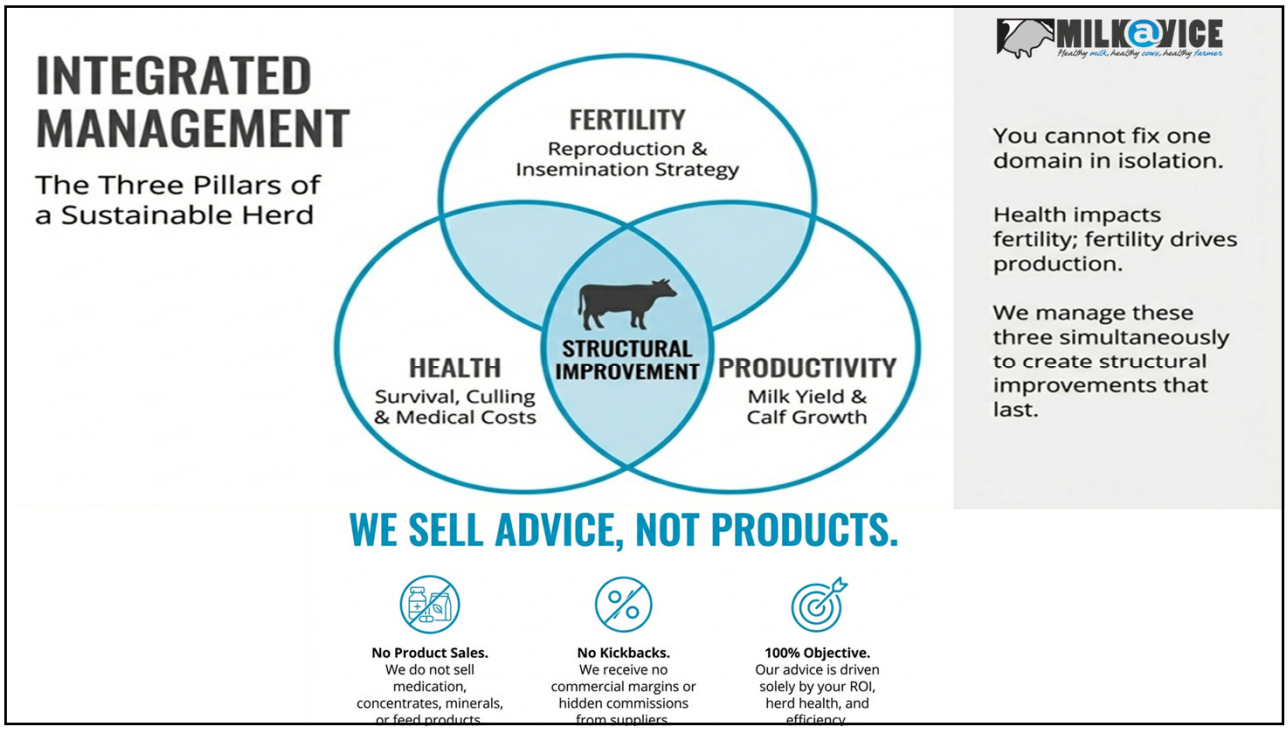
INTEGRATED MANAGEMENT
The Three Pillars of a Sustainable Herd
FERTILITY
Reproduction & Insemination Strategy
HEALTH
Survival, Culling & Medical Costs
STRUCTURAL IMPROVEMENT
PRODUCTIVITY
Milk Yield & Calf Growth
MILK@VICE
You cannot fix one domain in isolation.
Health impacts fertility; fertility drives production.
We manage these three simultaneously to create structural improvements that last.
WE SELL ADVICE, NOT PRODUCTS.
No Product Sales. We do not sell medication, concentrates, minerals, or feed products
No Kickbacks. We receive no commercial margins or hidden commissions from suppliers
100% Objective. Our advice is driven solely by your ROI, herd health, and efficiency

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WHAT SHOULD WE FOCUS ON?

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J. Dairy Sci. 105:3687–3701
https://doi.org/10.3168/jds.2021-21215

Symposium review: The role of adipose tissue in transition dairy cows: Current knowledge and future opportunities*

S. Mann†
Department of Population Medicine and Diagnostic Sciences, College of Veterinary Medicine Cornell University, Ithaca, NY 14853

J. Dairy Sci. 102:5577–5587
https://doi.org/10.3168/jds.2018-15828

The high-fertility cycle: How timely pregnancies in one lactation may lead to less body condition loss, fewer health issues, greater fertility, and reduced early pregnancy losses in the next lactation

E. L. Middleton, T. Minela, and J. R. Pursley*
Department of Animal Science, Michigan State University, East Lansing 48824

J. Dairy Sci. 104:8380–8410
https://doi.org/10.3168/jds.2021-20330

Invited review: The influence of immune activation on transition cow health and performance—A critical evaluation of traditional dogmas

E. A. Horst, S. K. Kvidera, and L. H. Baumgard*
Department of Animal Science, Iowa State University, Ames 50011

The Cornell Net Carbohydrate and Protein System: Updates to the model and evaluation of version 6.5

M. E. Van Amburgh,*[1] E. A. Collao-Saenz,† R. J. Higgs,* D. A. Ross,* E. B. Recktenwald,* E. Raffrenato,‡ L. E. Chase,* T. R. Overton,* J. K. Mills,§ and A. Foskolos*
*Department of Animal Science, Cornell University, Ithaca, NY 14850
†Department of Animal Science, Federal University of Goiás, Jataí, Brazil 75800-970
‡Department of Animal Sciences, Stellenbosch University, Stellenbosch, South Africa 7600
§Elanco Animal Health, Canastota, NY 13032

J. Dairy Sci. 102:11701–11717
https://doi.org/10.3168/jds.2019-17025

Long-term effects of postpartum clinical disease on milk production, reproduction, and culling of dairy cows

M. R. Carvalho,[1] F. Peñagaricano,[2] J. E. P. Santos,[2] T. J. DeVries,[1] B. W. McBride,[1] and E. S. Ribeiro[1]*
[1]Department of Animal Biosciences, University of Guelph, ON, Canada, N1G 2W1
[2]Department of Animal Sciences, University of Florida, Gainesville 32611

J. Dairy Sci. 105:4679–4689
https://doi.org/10.3168/jds.2021-21431

Symposium review: The implications of spontaneous versus synchronized ovulations on the reproductive performance of lactating dairy cows*

P. M. Fricke† and M. C. Wiltbank
Department of Animal and Dairy Sciences, University of Wisconsin-Madison, Madison 53706

J. Dairy Sci. 107:4409–4425
https://doi.org/10.3168/jds.2023-24355

Farm-level nutritional factors associated with milk production and milking behavior on Canadian farms with automated milking systems

B. J. Van Soest,[1] R. D. Matson,[1] D. E. Santschi,[2] T. F. Duffield,[3] M. A. Steele,[1] K. Orsel,[4] E. A. Pajor,[4] G. B. Penner,[5] T. Mutsvangwa,[5] and T. J. DeVries[1]*
[1]Department of Animal Bioscience, University of Guelph, Guelph, ON N1GZW1, Canada
[2]Lactanet, Sainte-Anne-de-Bellevue, QC H9X3R4, Canada
[3]Department of Population Medicine, University of Guelph, Guelph, ON N1G1Y2, Canada
[4]Faculty of Veterinary Medicine, University of Calgary, Calgary, AB T2N4Z6, Canada
[5]Department of Animal and Poultry Science, University of Saskatchewan, Saskatoon, SK S7N5A8, Canada

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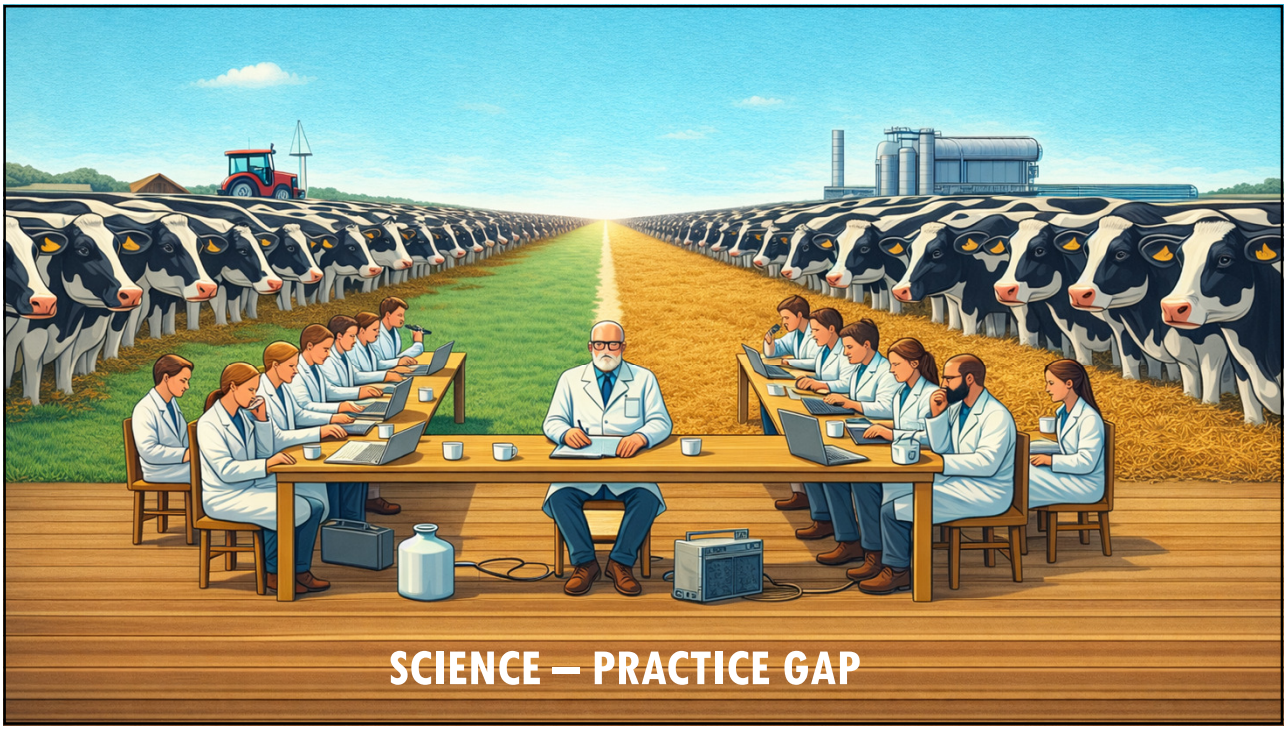

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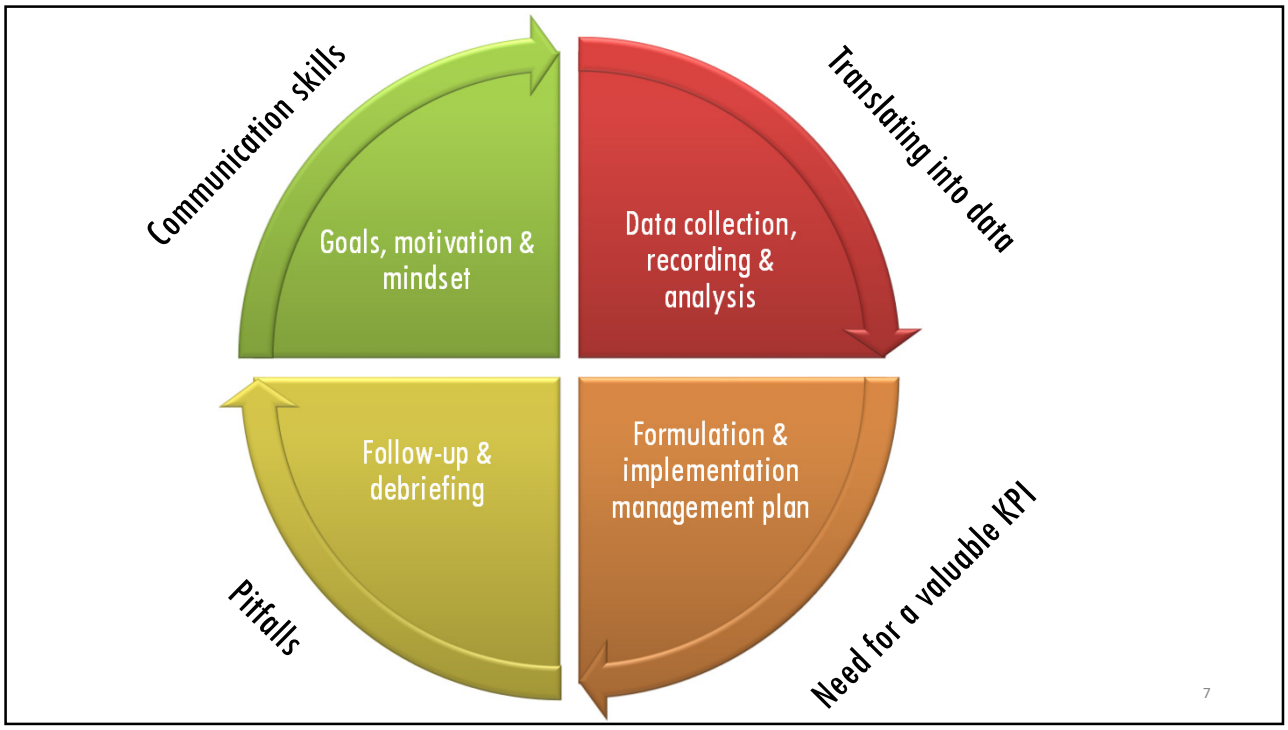

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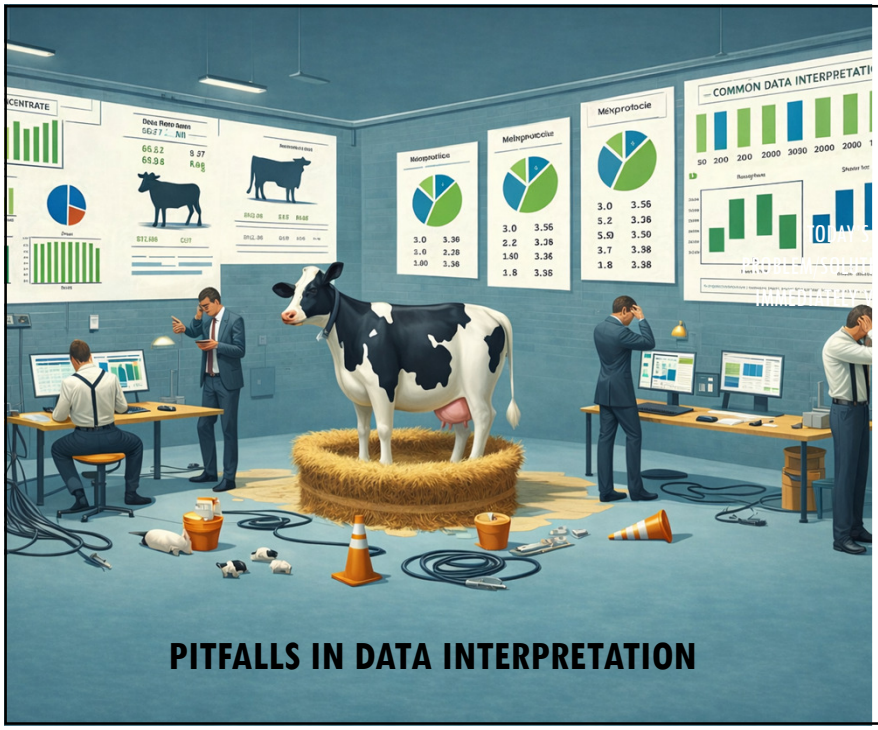

AVERAGES MASK VARIATION WITHIN A DATASET

TODAY'S PROBLEM/SOLUTION NOT IMMEDIATELY VISIBLE

HISTORICAL DATA MASK CURRENT OUTCOMES

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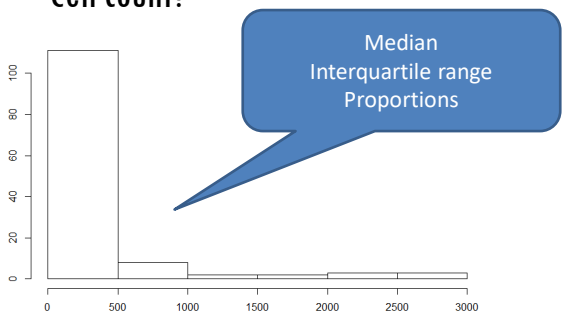
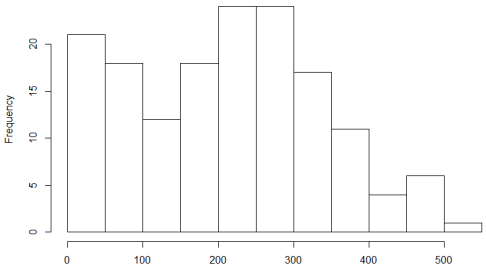
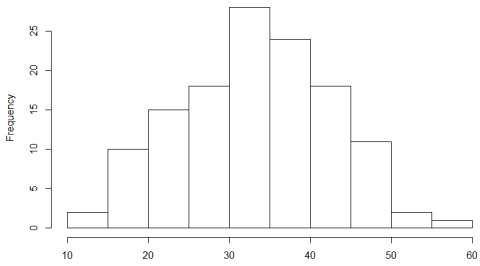
Is the data normally distributed?

- Calving interval?
- Daily milk yield?
- Days in lactation?
- Cell count?







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LAG

- Lag : period between the moment an event occurs and the moment it is measured
- Fertility:
  - Recent reproductive problem -> no effect on calving interval
  - High calving interval -> possible problem 9 months ago
- Udder health:
  - Better hygiene in youngstock barn-> first SCC after calving

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MOMENTUM

- Momentum : historical data mask actual performances
- EXAMPLE:
  - 100 cow herd – of which 10 cows <30 DIM
  - Situation 1:
  - 10 cows : 35 l/day
  - 90 cows : 25 l/day

350 l + 2250 l = 2600 l / day = 26 l/cow/day

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MOMENTUM

- 100 cow herd – of which 10 cows <30 DIM
- Situation 2: (additive +2l in start of lactation)
  - 10 cows : 37 l/day
  - 90 cows : 25 l/day

370 l + 2250 l = 2620 l / day = 26,2 l/cow/day

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MOMENTUM

- 100 cow herd – of which 10 cows <30 DIM
- Situation 3 : (after 1 year)
  - 10 cows : 37 l/day
  - 90 cows : 27 l/day

370 l + 2430 l = 2800 l / day = 28 l/cow/day

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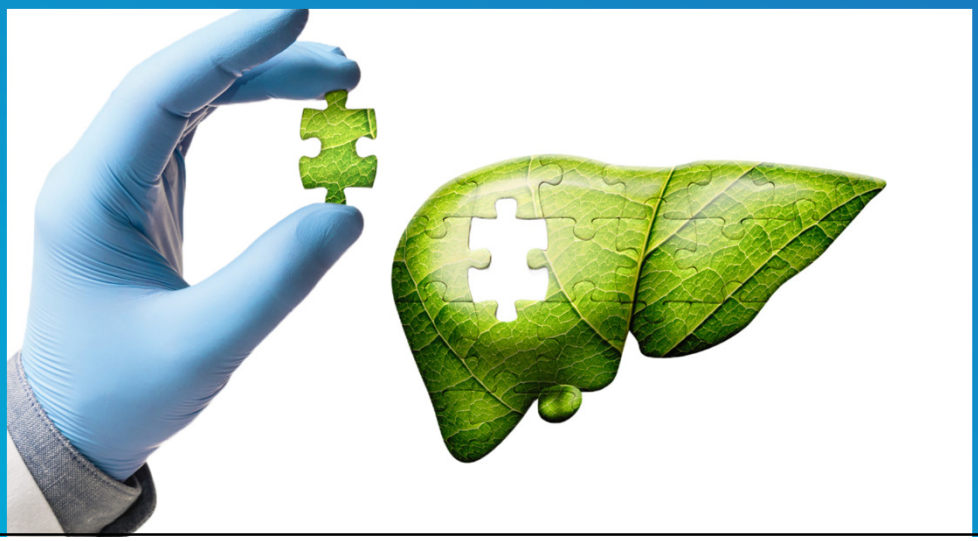
TRANSITION PHASE & LIVER FUNCTION



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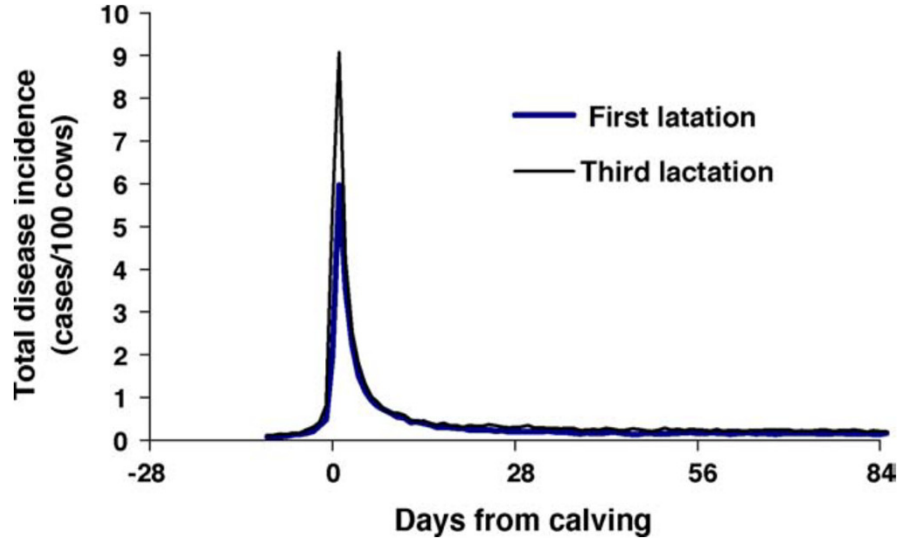
TRANSITION



Ingvartsen, 2006

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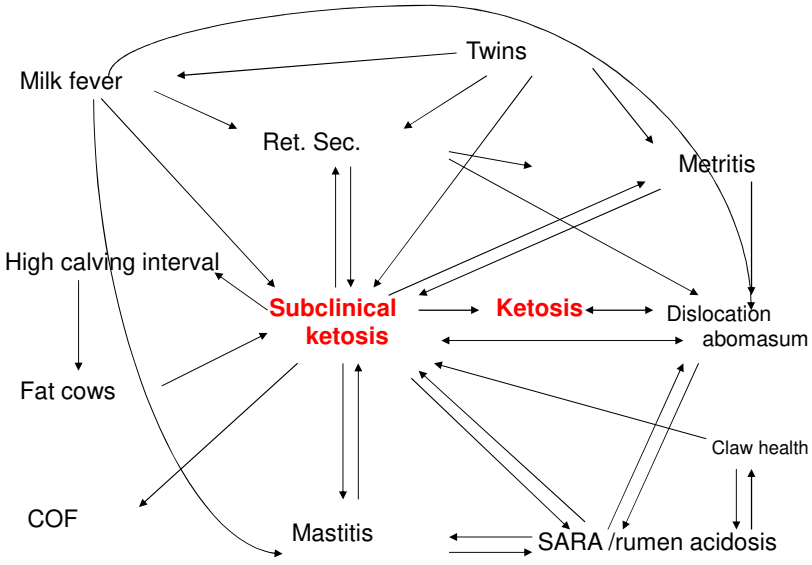
CORRELATIONS



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EFFECT ON MILK PRODUCTION

J. Dairy Sci. 102:11701–11717
https://doi.org/10.3168/jds.2019-17025

Long-term effects of postpartum clinical disease on milk production, reproduction, and culling of dairy cows

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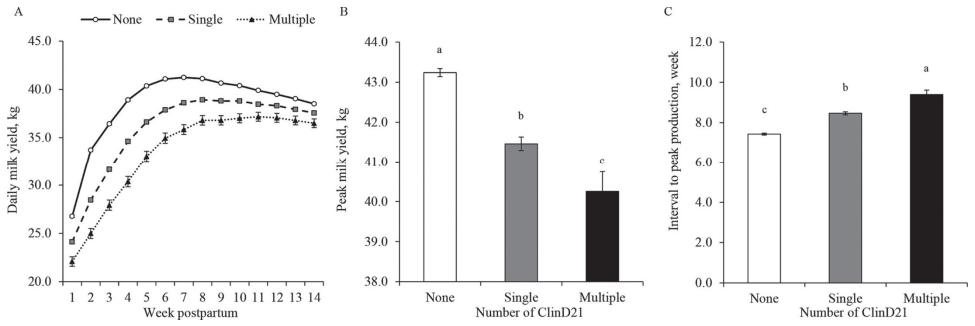

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EFFECT ON CONCEPTION RATE

Health Problems in the First 60 DIM and Pregnancy in Dairy Cows

Category	Pregnant, %	Adjusted OR (95% CI)	*P*
Healthy	51.4	1.00	
1 case of disease	43.3	0.79 (0.69 – 0.91)	0.001
> 1 case of disease	34.7	0.57 (0.48 – 0.69)	< 0.001
Type of health problem			
Calving problem	40.3	0.75 (0.63 – 0.88)	< 0.001
Metritis	37.8	0.66 (0.56 – 0.78)	< 0.001
Clinical endometritis	38.7	0.62 (0.52 – 0.74)	< 0.001
Fever postpartum	39.8	0.60 (0.48 – 0.65)	< 0.001
Mastitis	39.4	0.84 (0.64 – 1.10)	0.20
Clinical ketosis	28.8	0.50 (0.36 – 0.68)	< 0.001
Lameness	33.3	0.57 (0.41 – 0.78)	< 0.001
Pneumonia	32.4	0.63 (0.32 – 1.27)	0.20
Digestive problem	36.7	0.78 (0.46 – 1.34)	0.38

5,719 postpartum dairy cows evaluated daily for health disorders in seven dairy farms in the US

Santos *et al.* (2010) Soc. Reprod. Fertil. 67:387-403 19

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EFFECT ON PREGNANCY LOSS

Health Problems and Pregnancy Loss in the First 60 d of Gestation in Dairy Cows

Category	Loss, %	Adjusted OR (95% CI)	*P*
Healthy	8.9	1.00	---
1 case of disease	13.9	1.73 (1.25 – 2.39)	< 0.001
> 1 case of disease	15.8	2.08 (1.36 – 3.17)	< 0.001
Type of health problem			
Calving problem	15.9	1.67 (1.16 – 2.40)	< 0.01
Metritis	11.3	1.01 (0.71 – 1.60)	0.76
Clinical endometritis	15.1	1.55 (1.04 – 2.32)	0.03
Fever postpartum	18.0	2.00 (1.24 – 3.14)	< 0.01
Mastitis	19.8	2.62 (1.48 – 4.64)	< 0.001
Clinical ketosis	14.6	1.64 (0.75 – 3.59)	0.22
Lameness	26.4	2.67 (1.38 – 5.12)	< 0.01
Pneumonia	16.7	1.87 (0.40 – 8.69)	0.42
Digestive problem	15.8	1.81 (0.52 – 6.32)	0.35

5,719 postpartum dairy cows evaluated daily for health disorders in seven dairy farms in the US.

Santos *et al.* (2010) Soc. Reprod. Fertil. 67:387-403 20

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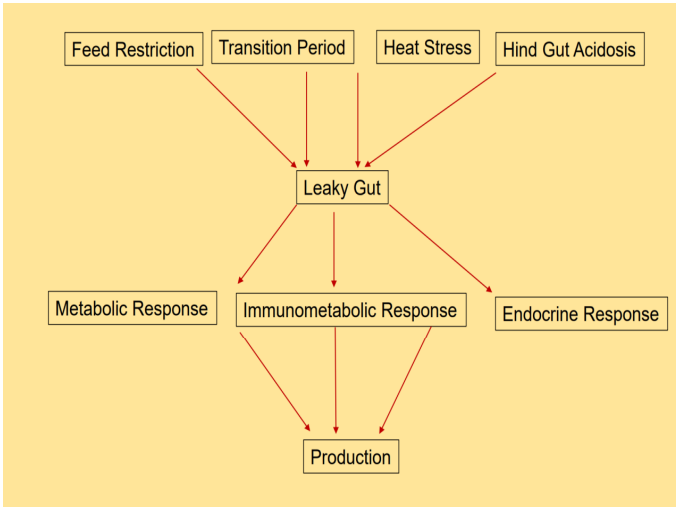
STRESS & LEAKY GUT



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BEST MANAGEMENT PRACTICES

DURING THE TRANSITION PHASE

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SUCCES FACTORS

DRY MATTER INTAKE

NUTRIENTS

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DRY MATTER INTAKE

INFLUENCED BY

Stress

Availability

Palatability

Disease

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DRY MATTER INTAKE

FRESH FEEDING – AIM 5% REFUSALS

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DRY MATTER INTAKE

MINIMUM 75CM BUNK SPACE

25

DRY MATTER INTAKE

STOCKING DENSITY MAXIMUM 85%

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DRY MATTER INTAKE

MINIMUM 10 M² PER COW ON BEDDED PACK

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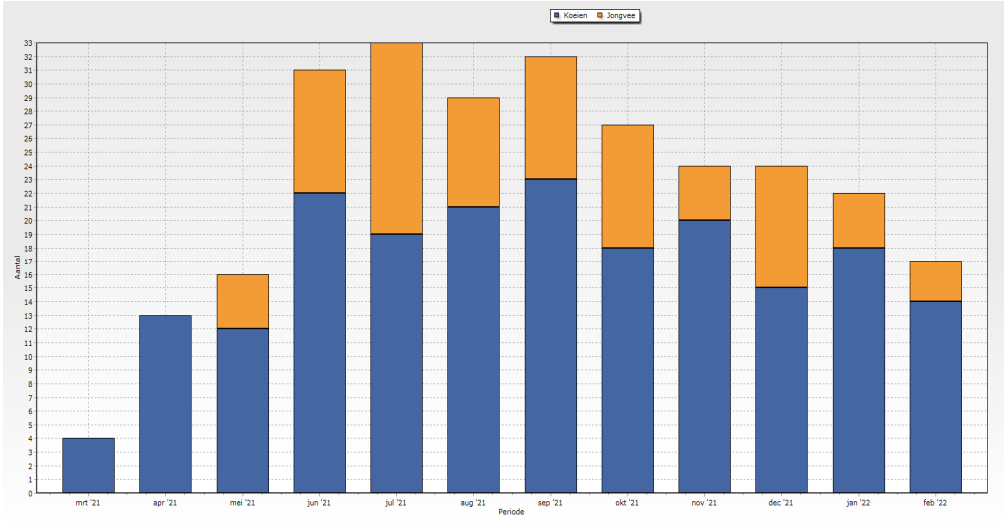
DRY MATTER INTAKE



BUILD FOR 130% - 140% OF AVERAGE MONTHLY CALVINGS

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DRY MATTER INTAKE

COW COMFORT

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DRY MATTER INTAKE

<24HOURS IN CALVING PEN

30

DRY MATTER INTAKE

SEPARATE HEIFERS

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DRY MATTER INTAKE

MINIMIZE GROUP CHANGES

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DRY MATTER INTAKE

2 DRINKERS PER GROUP – 10% COWS DRINKING AT SAME TIME

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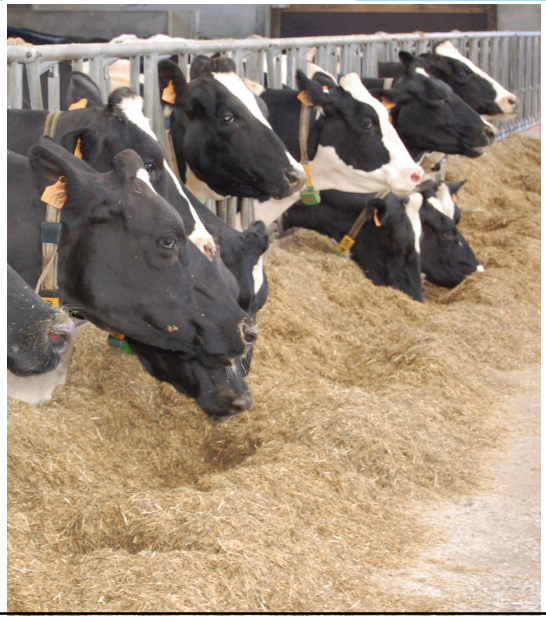
NUTRIENTS



GUIDELINES

METABOLISABLE PROTEIN

STARCH

NDF

MINERALS&VITAMINS

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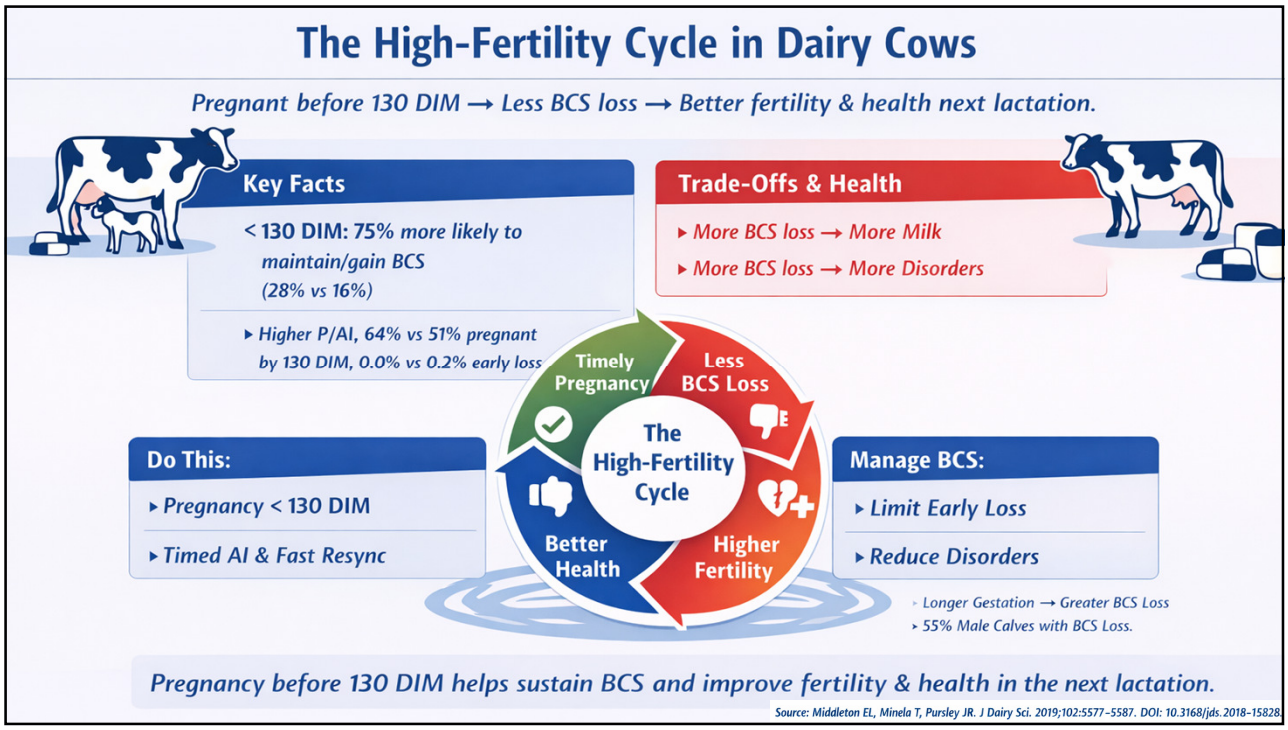
The High-Fertility Cycle in Dairy Cows
Pregnant before 130 DIM → Less BCS loss → Better fertility & health next lactation.
Key Facts
< 130 DIM: 75% more likely to maintain/gain BCS (28% vs 16%)
Higher P/AI, 64% vs 51% pregnant by 130 DIM, 0.0% vs 0.2% early loss
Trade-Offs & Health
More BCS loss → More Milk
More BCS loss → More Disorders
Timely Pregnancy
Less BCS Loss
The High-Fertility Cycle
Better Health
Higher Fertility
Do This:
Pregnancy < 130 DIM
Timed AI & Fast Resync
Manage BCS:
Limit Early Loss
Reduce Disorders
Longer Gestation → Greater BCS Loss
55% Male Calves with BCS Loss.
Pregnancy before 130 DIM helps sustain BCS and improve fertility & health in the next lactation.
Source: Middleton EL, Minela T, Pursley JR. J Dairy Sci. 2019;102:5577–5587. DOI: 10.3168/jds.2018-15828

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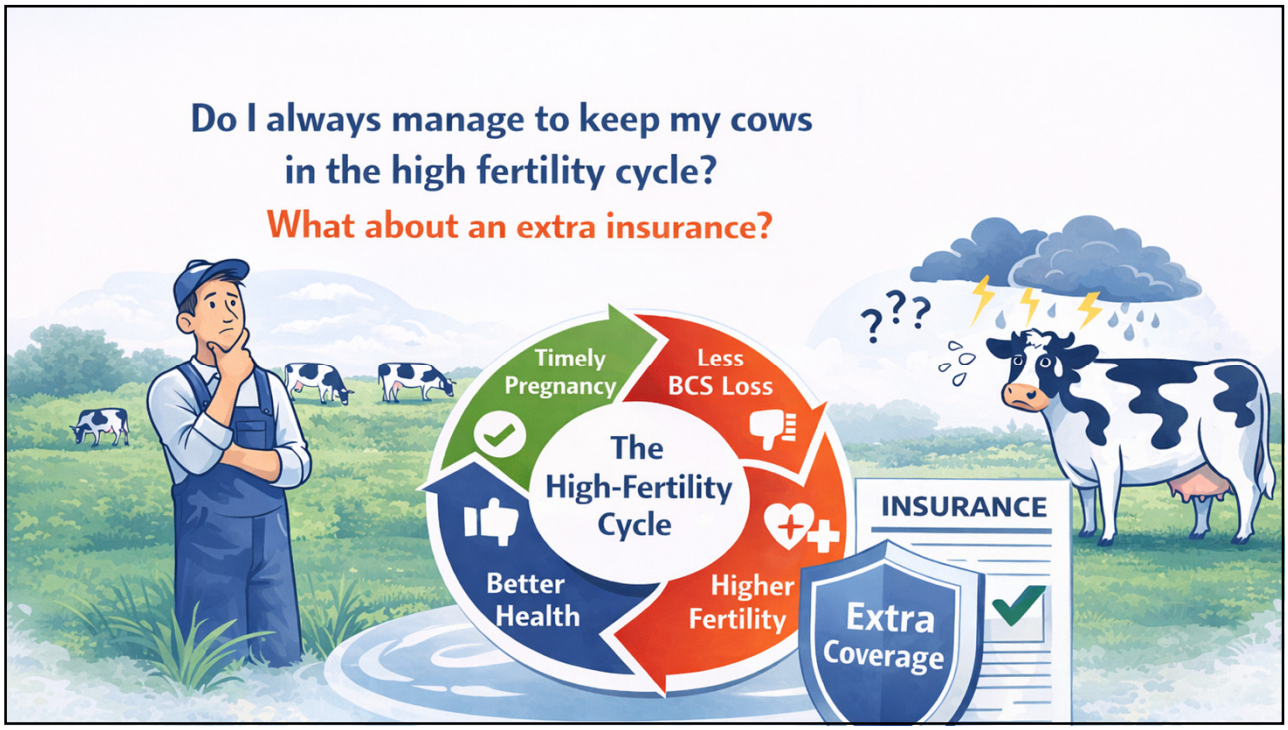
Do I always manage to keep my cows in the high fertility cycle?
What about an extra insurance?
Timely Pregnancy
Less BCS Loss
The High-Fertility Cycle
Better Health
Higher Fertility
INSURANCE
Extra Coverage
???

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FIELD TRIAL 1

USE OF CHOLINE IN TRANSITION STRATEGY

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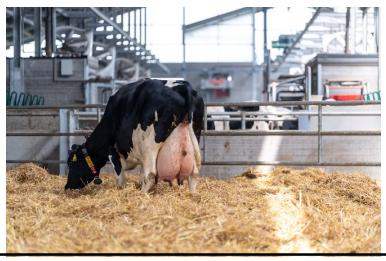
MILK@VICE
Healthy milk, healthy cows, healthy farmer

FARM & AIM

- Barn 1 : TRIAL
  - 230 Multiparous Holstein
  - 4 Lely A5 robots
  - Sand-filled deep-bed stalls
- Ration typically includes corn silage, grass silage, sugar beet pulp and concentrates
- Holstein cows (36kg/day) with high risk of metabolic disorders based on BCS *(1kg = 2.2 pounds)*

- Effect of supplemental encapsulated choline ([1]RPC) on:
  - Metabolic health
  - Milk production
  - Milk components
  - Reproduction

[1]RPC
CholiGEM™
(Kemin Industries Inc., USA)



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TRIAL SET-UP

- Supplementation:
  - Close up (14d before expected calving) : 30 g/cow/day RPC
  - Lactation (until 40 day post-partum) : 30 g/cow/day RPC
- RPC was fed in pelleted feed
  - As pelleted feed given to close-up group (automatic feeder) & to lactating cows (AMS)
  - 4 weekly calibrations were done
- Off/on set up
  - Control group : cows calved in May-June (n=60)
  - RPC group: cows calved in July- August (n=90)

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OUTCOME PARAMETERS

- Milk production data:
  - DHI
  - Daily milk recordings (Lely)
- Fertility data:
  - UniformArgos (management software)
- BCS & BHBA:
  - Vetwerk (software milk@vice)
- Standard Peak Production
- Calculation corrected for:
  - Age
  - Time of pregnancy
  - Days in lactation
- Influenced by management, nutrition,…

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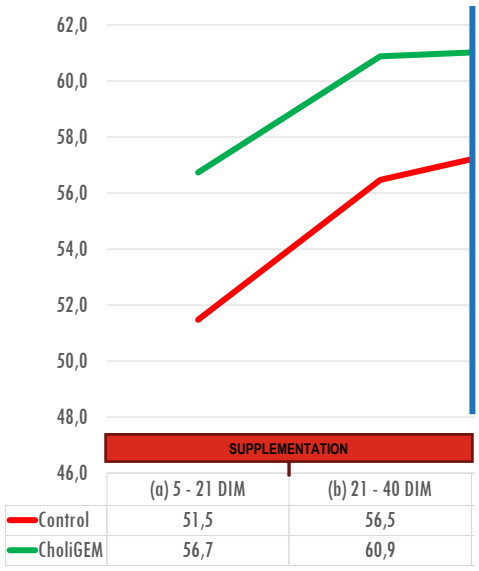
RESULTS – MILK YIELD - SPP



	(a) 5 - 21 DIM	(b) 21 - 40 DIM
Control	51,5	56,5
CholiGEM	56,7	60,9

(1kg = 2.2 pounds)

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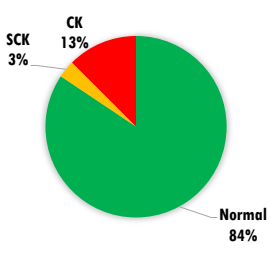
RESULTS – FPCM - BHBA

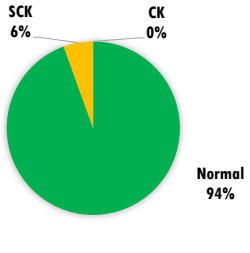
Parity	RPC	Control
Parity = 2	48.0	45.8
Parity >2	52.0	49.3
TOTAL	50.0	47.7

(1kg = 2.2 pounds)

Fat & Protein Corrected Milk : + 2.3 kg during the first 120 DIM



RPC



CONTROL

Fewer cows with clinical ketosis

BHBA levels : Normal < 1.2mmol/l - Subclinial ketosis (SCK) 1.2-2mmol/l - Clinical ketosis (CK) >2mmol/l

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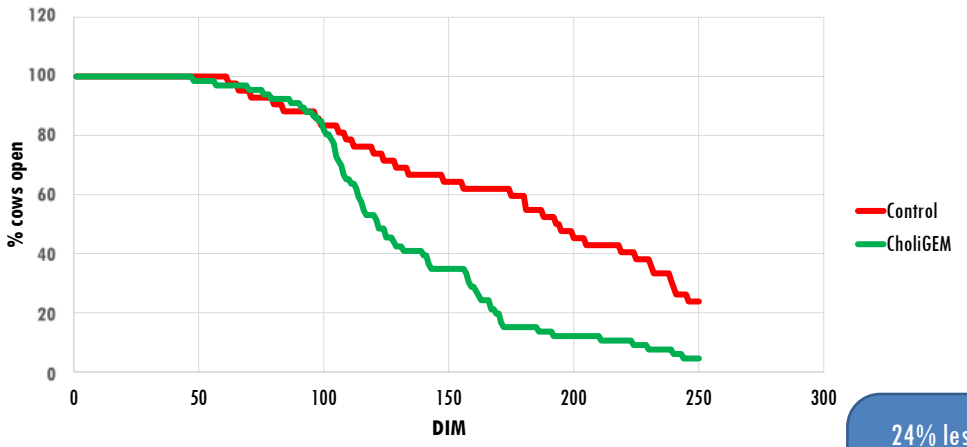
RESULTS – FERTILITY



	Days open		% Culled cows
	Mean	Median	Mean
Control	187	192	22%
CholiGEM	**132**	**115**	**12%**

24% less inseminations needed in RPC group (2.1 AI in RPC vs 2.8 AI in CONTROL group)

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FIELD TRIAL 2

USE OF CHOLINE FOR FRESH COWS

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FARM – AIM – TRIAL SET UP

- Barn :
  - 75 Holsteins (heifers & cows)
  - 1 Lely A3 robot
  - Rubber stall mattresses
- Ration typically includes corn silage, grass silage, sugar beet pulp and concentrates
- Average producing cows (30kg/day) with low risk of metabolic disorders based on BCS

(1kg = 2.2 pounds)

- Supplementation :
  - Only during the first 60 days post-partum : 30 g/cow/day RPC
  - Cows & heifers were blocked by parity and expected production levels
  - Supplementation was alternately assigned to the control (n=43) or RPC group (n=36)
- RPC was fed in AMS
  - Supplementation was dosed via an automatic Black V Dosator (Hanskamp) in the AMS and spread over multiple doses per day
  - 4 weekly calibrations were done

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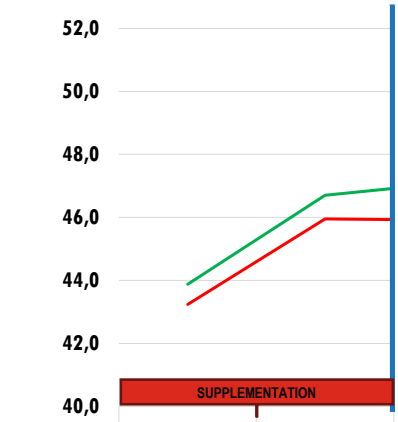
RESULTS – MILK YIELD - SPP



	(a) 5 - 40 DIM	(b) 41 - 60 DIM
Control	43,2	45,9
CholiGEM	43,9	46,7

(1kg = 2.2 pounds)

On average + 1.9 SPP milk during 305 DIM

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RESULTS – MILK YIELD - FPCM

Parity	RPC	Control
Heifers	30.2	30.2
Cows	41.1	39.0

(1kg = 2.2 pounds)

Fat & Protein Corrected Milk : + 2.1kg during 180 DIM in cows

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CONCLUSION FARM TRIALS

- Effects of supplemental encapsulated choline (RPC) on commercial dairy farms:
  - Metabolic health:
    - Fewer cases of clinical ketosis
  - Milk production:
    - Higher milk production resulting in higher FPCM
    - Legacy effect
  - Reproduction:
    - Fewer inseminations
    - Shorter calving interval
    - Lower culling rate

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QUESTIONS?

pieter@milkadvice.be

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