



NIEUWE INZICHTEN AANGAANDE KALVEROPFOK

Dr Geert Hoflack
MSD Animal Health

8 juni 2022

Vleesveecongres 2022

 **MSD**
Animal Health

The Science of Healthier Animals®

Vleesveecongres 2022



VLEESVEE

- Zoogkalveren
- Spenen bij geboorte
 - Veel voorkomend bij BWB

Vleesveecongres 2022



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- Zoogkalveren
- **Spenen bij geboorte**
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Nieuwe inzichten

1. Nieuwe serum IgG normen ter controle van het biestbeleid
2. Belang van transitiemelk
3. Huisvesting per 2

Nieuwe inzichten

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2. Belang van transitiemelk

3. Huisvesting per 2

NIEUWE SERUM IGG NORMEN TER CONTROLE VAN HET BIESTBELEID

Nieuwe serum IgG normen ter controle van het biestbeleid



J. Dairy Sci. 103

<https://doi.org/10.3168/jds.2019-17955>

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Consensus recommendations on calf- and herd-level passive immunity in dairy calves in the United States

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Nieuwe serum IgG normen ter controle van het biestbeleid

Biestbeleid <> **F**ailure of **P**assive **T**ransfer

Norm:

- < 10 g IgG / l serum = FPT
- \geq 10 g Ig G / l serum = succes
- Gebaseerd op meer / minder sterfte

J. Dairy Sci. 92:286–295

doi:10.3168/jds.2008-1433

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Evaluation of the effects of oral colostrum supplementation during the first fourteen days on the health and performance of preweaned calves

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College of Veterinary Medicine, Washington State University, Pullman 99164

Table 2. Results from a multivariate proportional hazards model of mortality in calves during the first 28 d of life from 3 field trials (ranches A, B, and C) evaluating the efficacy of feeding a colostrum supplement in milk replacer for 14 d to preweaned calves

Variable	Level	Hazard ratio	90% CI ¹		Wald's <i>P</i> -value
			Lower	Upper	
Treatment group ²	CS	1.02	0.52	1.98	0.96
	PS	0.86	0.44	1.69	0.72
	UC	Reference	—	—	—
Weight category ³	Low	0.96	0.44	2.07	0.93
	Mid	0.71	0.33	1.52	0.46
	High	Reference	—	—	—
Serum IgG status ⁴	FPT	26.22	7.60	90.38	<0.01
	PFPT	5.88	1.68	20.52	0.02
	APT	Reference	—	—	—
Calf ranch	A	0.29	0.14	0.60	<0.01
	B	0.44	0.21	0.95	0.08
	C	Reference	—	—	—

¹CI = confidence interval.

²CS = colostrum supplement (70 g of dried colostrum powder) added to milk replacer; PS = placebo supplement (70 g of nutritionally matched supplement without IgG) added to milk replacer; UC = unsupplemented control.

³Low: ≤38.5 kg; mid: between 38.6 and 45 kg; high: ≥45 kg.

⁴FPT = failure of passive transfer: IgG ≤350 mg/dL; PFPT = partial failure of passive transfer: IgG between (and including) 351 and 999 mg/dL; and APT = adequate passive transfer: IgG ≥1,000 mg/dL.

Nieuwe serum IgG normen ter controle van het biestbeleid

Biestbeleid <> **F**ailure of **P**assive **T**ransfer

Norm:

- < 10 g IgG / l serum = FPT
- ≥ 10 g Ig G / l serum = succes
- Gebaseerd op meer / minder sterfte

USA sedert 1991

- 90% van de kalveren ≥ 10 g IgG / l serum
- Mortaliteit (sterfte) dalend
- Morbiditeit (ziekte) onveranderd

Serum IgG titer voor lagere morbiditeit?

Nieuwe serum IgG normen ter controle van het biestbeleid

Vier opties:

- Optie 1: < 10 , $10 - 19.9$, ≥ 20 g IgG/l
- Optie 2: < 10 , $10 - 24.9$, ≥ 25 g IgG/l
- Optie 3: < 10 , $10 - 17.9$, $18 - 24.9$, ≥ 25 g IgG/l
- Optie 4: < 10 , $10 - 14.9$, $15 - 19.9$, $20 - 24.9$, ≥ 25 g IgG/l

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Keuze gebaseerd op:

- Gegevens 'National Animal Health Monitoring System, Dairy 2014 Calf Component'
- Meerdere studies omtrent vereiste serum IgG titer om morbiditeit te reduceren
- Statistische analyses en modellen
- Persoonlijke ervaringen van de betrokken kalverexperten.

Nieuwe serum IgG normen ter controle van het biestbeleid

National Animal Health Monitoring System Dairy 2014 Calf Component

Bij **2360 vaarskalveren** op 103 verschillende melkveebedrijven:

- Herkomst van de biest
- Hoeveelheid opgenomen biest
- Tijdstip van opname
- Colostrale IgG concentratie
- Serum IgG concentratie, totaal serum proteïne en serum Brix % 1-7 d
- Ziek: Apathie en/of Diarree en/of Pneumonie

Nieuwe serum IgG normen ter controle van het biestbeleid

Serum IgG titer voor lagere morbiditeit?

KALFNIVEAU				
CATEGORIËN	IgG (g/L)	TOTAAL PROTEINE (g/L)	BRIX REFRACTOMETER %	AANTAL KALVEREN
Excellent	≥ 25	≥ 62	≥ 9.4	> 40%
Goed	18-24.9	58-61	8.9-9.3	~ 30%
Redelijk	10-17.9	51-57	8.1-8.8	~ 20%
Slecht	< 10	< 51	< 8.1	< 10%

Nieuwe serum IgG normen ter controle van het biestbeleid

Serum IgG titer voor lagere morbiditeit?

CATEGORIËN	IgG (g/L)	N	%	MORBIDITEIT	N	MORTALITEIT	N
Excellent	≥ 25	838	35.5	28.5%	239	2.5%	21
Goed	18-24.9	607	25.7	34.8%	211	1.5%	9
Redelijk	10-17.9	631	26.8	36.1%	228	3.8%	24
Slecht	< 10	284	12	46.1%	131	7.4%	21
Totaal		2360	100	34.3%	809	3.2%	75

Nieuwe serum IgG normen ter controle van het biestbeleid

Serum IgG titer voor lagere morbiditeit?

CATEGORIËN	KALFNIVEAU			BEDRIJFSNIVEAU
	IgG (g/L)	TOTAAL PROTEINE (g/L)	BRIX REFRACTOMETER %	AANTAL KALVEREN
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704 kalveren > 25g IgG / l serum:

- 251 kalveren: 1 x colostrum
 - 2 uur na geboorte 3,3 l colostrum met 286,7 g IgG → 32 g IgG / l serum
- 453 kalveren: meerdere colostrum maaltijden
 - Eerste voeding: 2,8 uur na geboorte 2,7 l colostrum met 226,6 g IgG
 - Totaal: eerste 24 levensuren 5,3 l colostrum met 421,2 g IgG → 33,9 g IgG / l serum

Nieuwe serum IgG normen ter controle van het biestbeleid

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- Ziek: Apathie en/of Diarree en/of Pneumonie

- **Hetzij éénmalig ongeveer 300 g IgG te verschaffen ongeveer 2 uur na de geboorte,**
- **Hetzij door via meerdere colostrum voederbeurten ongeveer 400 g IgG binnen de eerste 24 levensuren te verschaffen waarbij een eerste voederbeurt van ongeveer 200 g IgG ongeveer 3 uur na de geboorte gegeven wordt.**

Tweede colostrumvoeding?



animals



Article

Impact of 2 Versus 1 Colostrum Meals on Failure of Transfer of Passive Immunity, Pre-Weaning Morbidity and Mortality, and Performance of Dairy Calves in a Large Dairy Herd

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Animals **2021**, *11*, 782. <https://doi.org/10.3390/ani11030782>

<https://www.mdpi.com/journal/animals>

Tweede colostrumvoeding?

1 x voldoende kwalitatief colostrum kort na geboorte = OK <> FPT

Meerwaarde tweede colostrumvoeding als reeds voldoende IgG?

Proef: 1 groot melkveebedrijf

- 2064 stierkalveren en 2272 vaarskalveren = 4336 kalveren
- 3 l colostrum, > 22% Brix (27,6), 1h na geboorte (n = 180)
- + 2 l colostrum, > 21% Brix (25,6), 5 – 6 h later (n = 4156)

Tweede colostrumvoeding?

BRD

2V: 16,8%

1V: 33,9%

Diarree

2V: 36,4%

1V: 75,6%

Ziek

2V: 46,9%

1V: 82,2%

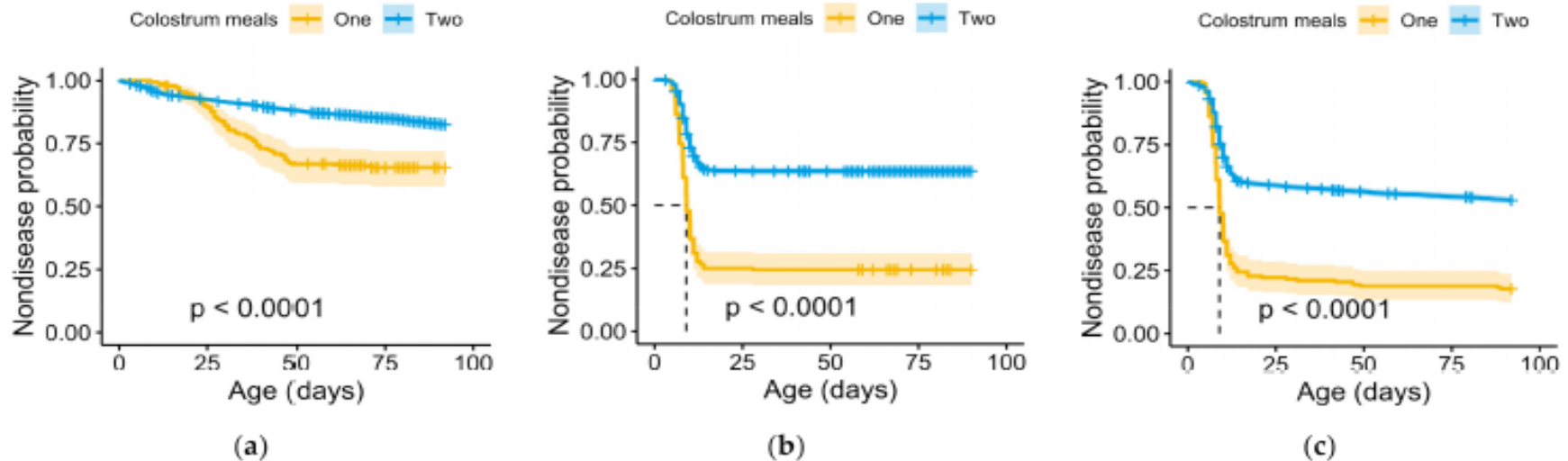


Figure 2. Kaplan-Meier survival curve of the non-disease probability of calves dependent on the number of colostrum meals received within the first 24 h of life for (a) respiratory disease, (b) diarrhea, and (c) any disease pre-weaning. *p* value based on the log-rank test.

Twede colostrumvoeding?

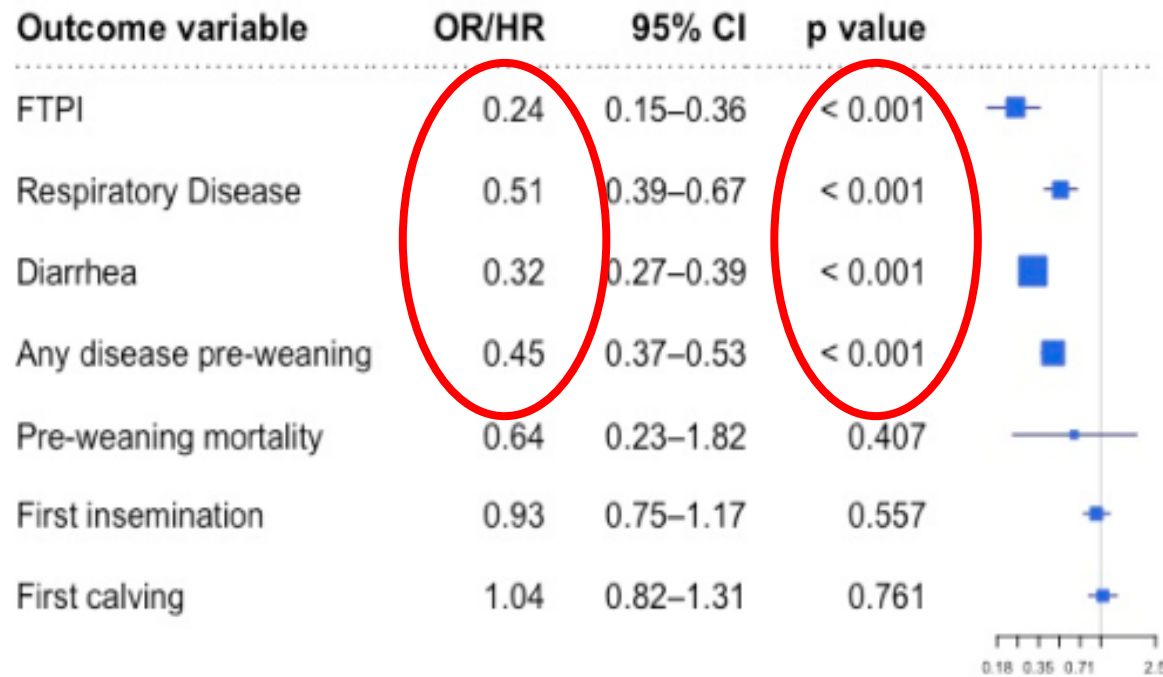


Figure 1. Forest plot showing the association of receiving a second colostrum feeding with failure of transfer of passive immunity (FTPI), pre-weaning disease and mortality, age at first insemination, and age at first calving. Results are reported considering one feeding of colostrum as the reference. The estimate is reported as odds ratio (OR) from logistic regression for FTPI and as Hazard Ratio (HR) from accelerated failure time (respiratory disease, any disease pre-weaning) or Cox proportional hazards (diarrhea, pre-weaning mortality, first insemination, and first calving) analysis.

Tweede colostrumvoeding?

Table 4. Comparison of pre-weaning average daily gain, number of inseminations, and 305ME between heifers receiving 1 or 2 colostrum meals after birth. Results reported as estimated means and 95% CI.

	Number of Colostrum Meals		<i>p</i> Value
	Two (<i>n</i> = 2126)	One (<i>n</i> = 136)	
Average daily gain (kg/d)	0.86 (0.79–0.93) ↔	0.74 (0.64–0.84)	<0.001
Number of inseminations	1.84 (1.78–1.90) ↔	2.13 (1.88–2.38)	0.066
First lactation 305ME (kg)	16,424 (15,249–18,329) ◆	15,440 (15,067–18,693)	0.081

Tweede colostrumvoeding!

National Animal Health Monitoring System Dairy 2014 Calf Component

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- **Hetzij éénmalig ongeveer 300 g IgG te verschaffen ongeveer 2 uur na de geboorte,**
- **Hetzij door via meerdere colostrum voederbeurten ongeveer 400 g IgG binnen de eerste 24 levensuren te verschaffen waarbij een eerste voederbeurt van ongeveer 200 g IgG ongeveer 3 uur na de geboorte gegeven wordt.**

- **200(-300) g IgG < (2-)3h na geboorte**
- **Extra 2 liter 5-6 uren later**

HET BELANG VAN TRANSITIEMELK



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Feeding colostrum or a 1:1 colostrum:whole milk mixture for 3 days after birth increases serum immunoglobulin G and apparent immunoglobulin G persistency in Holstein bulls

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Feeding colostrum or a 1:1 colostrum:milk mixture for 3 days postnatal increases small intestinal development and minimally influences plasma glucagon-like peptide-2 and serum insulin-like growth factor-1 concentrations in Holstein bull calves

J. Pyo,¹ K. Hare,² S. Pletts,¹ Y. Inabu,³ D. Haines,⁴ T. Sugino,³ L. L. Guan,¹ and M. Steele^{2*}

¹Department of Agricultural, Food and Nutritional Science, Faculty of Agricultural, Life and Environmental Sciences, University of Alberta, Edmonton, AB, Canada T6G 2P5

²Department of Animal Biosciences, Animal Science and Nutrition, University of Guelph, Guelph, ON, Canada N1G 1Y2

³The Research Center for Animal Science, Graduate School of Biosphere Science, Hiroshima University, Higashi-Hiroshima, Japan 739-8528

⁴The Saskatoon Colostrum Company Ltd., Saskatoon, SK, Canada S7K 6A2

Belang van transitiemelk?

Op veel bedrijven:

- 1 grote colostrumvoeding
- Daarna (kunst)melk

Transitiemelk (2^e – 6^e melkbeurt) voederen relevant?

Of: Mengsel 1/1 koemelk – colostrum?

Proef: 27 kalveren

- Eerste voeding: 7,5% LG (3,75 l voor 50 kg) colostrum met 62 g IgG / l, 2h
- Tweede – zesde melkbeurt (12-72h leeftijd): 5% LG (2,5 l voor 50 kg) 2x/d
 - Verder **colostrum** (n = 9)
 - **Mengsel 1/1 colostrum – volle melk** = Transitiemelk (2^e–6^e melkbeurt) (n = 9)
 - **Volle koemelk** (n = 9)

Belang van transitiemelk?

Hare et al.: EXTENDED COLOSTRUM FEEDING

11838

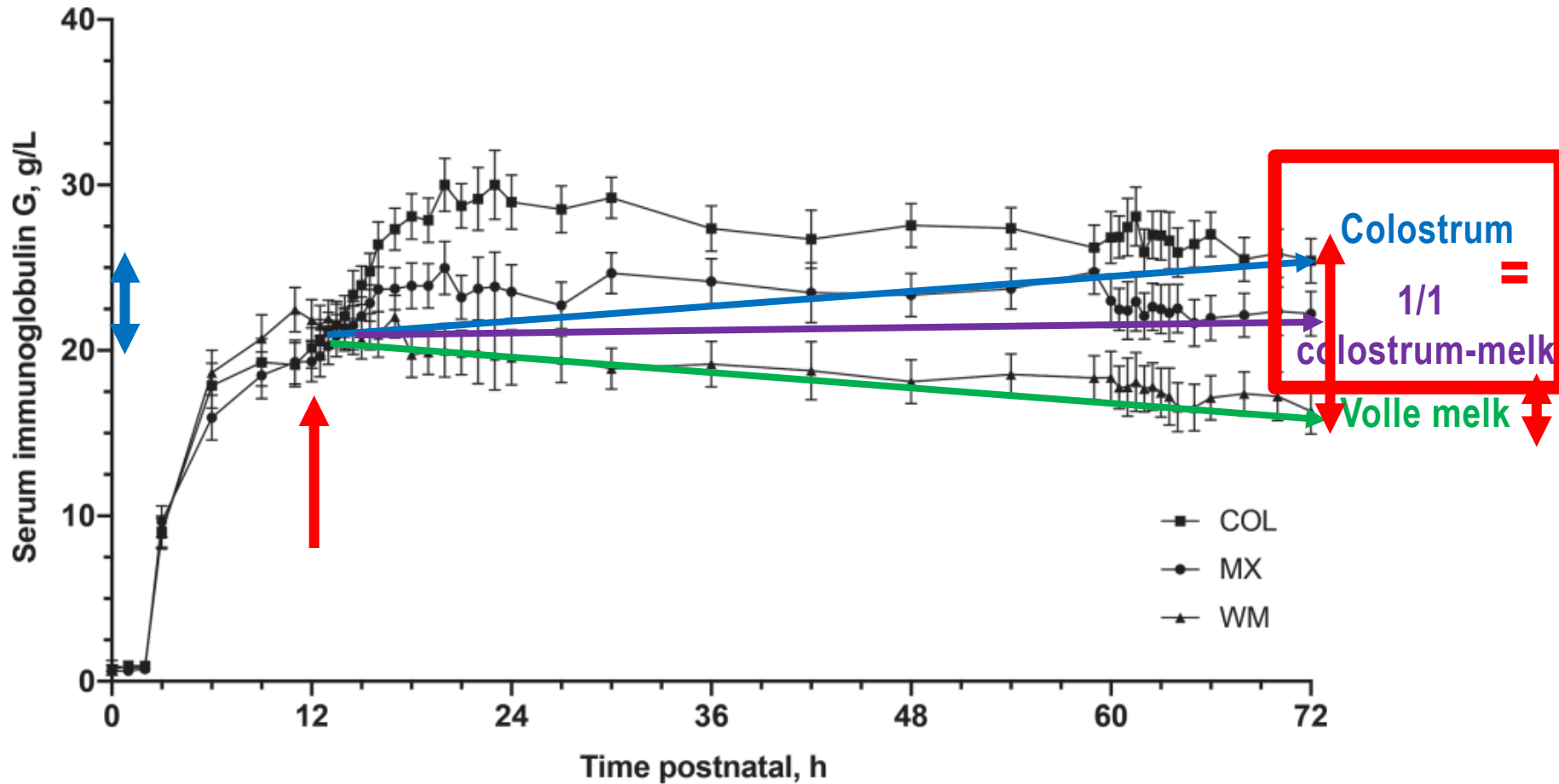


Figure 1. Serum IgG concentrations in calves fed colostrum (COL, n = 9), whole milk (WM, n = 9), or a 1:1 COL:WM mixture (MX, n = 9) from 12 to 72 h after birth after all calves had received an initial colostrum meal at 2 h after birth. Serum IgG concentrations began to diverge (treatment × time: $P < 0.001$) after 12 h between COL and MX calves and COL and WM calves but not MX and WM calves. The difference between COL and WM calves was maintained throughout the remaining experimental period, whereas by the end of the experiment, COL and MX no longer differed and MX serum IgG was greater than that of WM. The P -values for the main effects of treatment and time were both $P < 0.001$. Error bars represent SE.

Belang van transitiemelk!

Colostrum

=

1/1

>
↔ Volle melk

Pyo et al.: EXTENDED COLOSTRUM FEEDING

4243

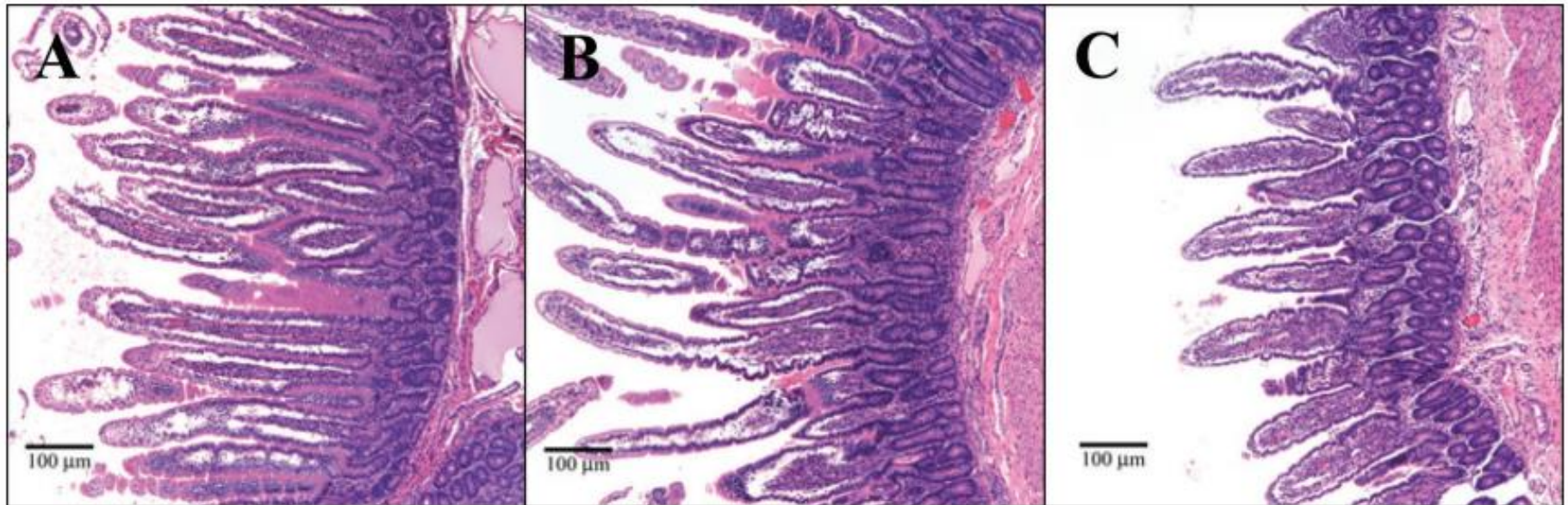


Figure 1. Brightfield microscopy images (200× magnification) of proximal jejunal tissue from calves that consumed either pooled and pasteurized colostrum (A), a 1:1 colostrum:whole milk mixture (B), or whole milk (C) from 12 to 72 h after an initial meal of colostrum at 2 h postnatal. Jejunal tissue is stained with hematoxylin and eosin for contrast.

Belang van transitiemelk!

Verlengde partiële colostrumgift!

- Gedurende 72 uur
 - 2 x daags 2,5 liter = 12,5 liter extra biest vereist
 - Onvoldoende...
 - BWB koeien 2-4 keer melken? <> Zoogkalveren transitiemelk
 - Voeder beperken!
- Gedurende 14 dagen
 - 2 x daags 50 – 100 ml = 1,35 - 2,7 liter extra colostrum vereist
 - Diarree preventie en extra groei
 - BWB koeien 2 keer melken: ~ 1/3 > 50 g IgG / l tweede melkbeurt

KALVEREN PER 2 HUISVESTEN

Huisvesting per 2



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Invited review: A systematic review of the effects of early separation on dairy cow and calf health

Annabelle Beaver,¹ Rebecca K. Meagher,² Marina A. G. von Keyserlingk,¹ and Daniel M. Weary^{1*}

¹Animal Welfare Program, Faculty of Land and Food Systems, University of British Columbia, 2357 Main Mall, Vancouver, BC, V6T 1Z4 Canada

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between cohorts. Overall, the articles addressing calf scours and mastitis pointed to beneficial or no effects of suckling. The studies addressing Johne's disease did not find cow-calf contact to be a significant risk factor. In conclusion, the scientific peer-reviewed literature on cow and calf health provides no consistent evidence in support of early separation.

Pneumonie?

<>

FPT?

≠

Sterfte?

~ FPT



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Huisvesting per 2



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In conclusion, the scientific peer-reviewed literature on cow and calf health provides no consistent evidence in support of early separation.

Als voldoende hygiëne!



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Huisvesting per 2



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Huisvesting per 2



J. Dairy Sci. 99:2453–2467

<http://dx.doi.org/10.3168/jds.2015-10144>

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Invited review: Effects of group housing of dairy calves on behavior, cognition, performance, and health

J. H. C. Costa, M. A. G. von Keyserlingk, and D. M. Weary¹

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In groep gehouden kalveren:

- KV-RV opname stijgt
- DG stijgt, voor en na spenen
- Gezondheid: + / - / = (groeps grootte)
- Socialer gedrag
- Vlotter omgaan met veranderingen = minder stress gevoelig

Huisvesting per 2



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Short communication: Pair housing dairy calves in modified calf hutches

L. Whalin, D. M. Weary, and M. A. G. von Keyserlingk¹

Animal Welfare Program, Faculty of Land and Food Systems, University of British Columbia, Vancouver, Canada, V6T 1Z4

Huisvesting per 2

Individuele huisvesting dag 0 – 5

Daarna:

- Ofwel individuele huisvesting (n = 14)
- Ofwel per 2 (n = 8 x 2)

Metingen:

- Elkaar bezuigen (1x / week ged 14 weken, 5 min scans eerste 30 min na drinken) **Slechts 5 keer/651 controles, 4 ≠ paren, speen!, 10 l melk/d**
- Starteropname **0,89 (P) vs 0,48 (I) kg KV / d**
- Gezondheid : 1x / week van dag 0 - 88 **Geen verschil**
- LG: 1x / week van dag 0 – 88 **Geen verschil**
- Nieuw 'vreemd' voer op dag 60
2,6 keer meer opname (150 (P) vs 58 (I) g/30 min)
= beter omgaan met stress

Huisvesting per 2

Europese directieve 2008/119/EC

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:010:0007:0013:EN:PDF>

Individuele huisvesting:

- Maximaal tot 8 weken leeftijd
- Visueel en tactiel contact
- Behalve als isolatiehok
- L: 1,1 x lengte neus-bekken = min 1,6 m
- B: 1,1 x schofthoogte = min 1 m

Leeftijdsverschil! 1d (d0) – 3d (d7)

2 iglo's met 1 buitenbeloop

$\geq 3\text{m}^2$ per 2

Groepshuisvesting:

- $\geq 1,5\text{m}^2$ / kalf voor kalveren < 150 kg
- $\geq 1,7\text{m}^2$ / kalf voor kalveren tussen 150 en 220 kg
- $\geq 1,8\text{m}^2$ / kalf voor kalveren > 220 kg

Moraal van het verhaal

Biestvoorziening

- 300 g IgG < 2 uur na geboorte
- 2 l extra biest na 5 – 6 uren
- 400 g IgG < 24 uren

Transitiemelk

- BWB koe 2 (- 4) keer melken
- Mengsel 1/1 melk – colostrum gedurende 3 dagen
- Melk + 50 – 100 ml colostrum tem 14 dagen leeftijd

Huisvesten per 2: $\geq 3\text{m}^2$



BEDANKT VOOR DE AANDACHT