Dam-reared calves: Lessons from pioneer farmers for Danish dairy producers

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In Denmark, separation of dairy calves from their dam commonly occur within the first 24 to 48 hours whereas weaning from milk occur around either 8 weeks (conventional) or 12 weeks (organic). Consumers increasingly question the practice of early separation, and there is a growing interest among Danish dairy farmers for developing new housing and management systems that incorporate a type of dam-rearing. Danish dairy farms are mostly relatively large with high-yielding cows in capital intensive and high cost systems that sets a tight margin for the milk price, which may challenge the implementation of dam-rearing. Several farmers in northern Europe practice different forms of dam-rearing, and their choices and experience may serve as inspiration for Danish dairy farmers. So far, we have visited 9 farms in Scotland, The Netherlands and Germany that represent a variety of breeds and a herd size ranging from 30 to 130 cows as well as an average of around 5,000 kg milk delivered plus 1,300 kg drunk per calf. The 5 highest yielding herds milk cows twice per day during the dam-rearing period. Six herds combine an initial period of full-time contact with a period of part-time dam-rearing. Separation occur between 4 and 22 weeks after calving, and 6 herds separate cow and calf abruptly whereas 4 herds wean calves abruptly. One case from The Netherlands and 1 from Scotland represent particularly promising systems for Danish dairy farmers. On the Dutch farm, calves are kept in separate deep litter area for the first 120 days, and a milking robot is used to gradually reduce the amount of time that the dams gain access to this area. Weaning occurs 2 weeks after separation with both separation and weaning done gradually. This farm delivers 9,500 kg of milk to the dairy per cow per year. On the Scottish farm, calves and dams are kept full-time in the same area the first 3 months and part-time the following 3 months. Weaning occurs gradually with nose flaps one week before a gradual separation. Based on these case studies, different implementation strategies will be developed and assessed for various impacts including production economics.

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AGENDA

- The push for a change in practice
- Danish dairy farming at a glance
- Terminology
- Farms pioneering dam-rearing as a practice
- Bridging lessons learned with Danish dairy farms
- Ways forward

THE PUSH FOR A CHANGE IN PRACTICE

Today's practice

- Separation within 24 to 48 h after calving
- Bucket feeding 8 (conv) to 12 wk (org)

Reasons for early separation[1]

- Financial profits
- Closer monitoring
- Milk let-down
- Minimize stress

However

- Growing public concerns[2-4]
- Positive social and welfare effects of dam-rearing[1,5,6]
- Campaigns from animal protection societies
- Questions received by dairy companies

[1]Meagher et al. (2019)
[2]Busch et al. (2017)
[3]Ventura et al. (2013)
[4]Meagy et al. (2017)
[5]Johnsen et al. (2016)
[6]Kälber & Barth (2014)

DANISH DAIRY FARMING AT A GLANCE

Means (SD) of 2015-2019	Conventional	Organic
Cows, n	200.5	176.2
Farm area, ha per cow	0.84	1.27
Milk yield, kg ECM per cow	10,298	9,227
Milk price, eurocent per kg ECM	33.3	45.2
Cows per standard employee*, n	57.4	47.4
Result, € per cow	314.1	803.3
Result, eurocent per kg ECM	3.0	8.7
Debt, eurocent per kg ECM	180	230
Equity, eurocent per kg ECM	31	59

In summary
- Large farms
- High-yielding cows
- High mechanisation
- High debt
- Low return on investment

Source: Statistics Denmark (farm accounts) - https://www.statbank.dk/statbank5a/default.asp?w=1920
*1,924 work hours per year.

TERMINOLOGY*

Differentiating dam-rearing systems

- Timing and type of separation
- Timing and type of weaning
- Length of dam-rearing period
- Length of milk-feeding period
- Proportion of day spent together
- Cow with access to calf or vice versa
- Combination with bucket feeding
- Combination with foster care
- Either or both male and female calves

*See Sirovnik et al. (2020) for discussion.

FARMS VISITED WITH DAM-REARING

Farm	Herd size	Milk yield*	Calving system	Dam-rearing system	Separation time**	Weaning type	Separation type
Scotland							
Farm 1	55	4,000	Spring	Partial	22 weeks	Abrupt	Abrupt
Farm 2	130	6,500	½ spring, ½ autumn	Partial	26 weeks	Gradual	Gradual
The Netherlands							
Farm 1	60	6,500	Summer	Full	4 weeks	Gradual	Abrupt
Farm 2	60	7,500	All-year	Full	10 weeks	Abrupt	Abrupt
Farm 3	65	11,000	All-year	Partial	17 weeks	Gradual	Gradual
Farm 4	50	6,000	All-year	Combination	16 weeks	Abrupt	Abrupt
Farm 5	45	7,000	All-year	Combination	10 weeks	Gradual	Gradual
Germany							
Farm 1	30	4,000	All-year	Full	14 weeks	Gradual	Abrupt
Farm 2	50	5,200	Spring	Full	15 weeks	Abrupt	Abrupt
Denmark							
Farm 1	250	12,200	All-year	Full	2 weeks	?	Abrupt

*Averages as assessed by the farmer. **Average for females is shown when different for males.

LESSONS LEARNED (1)

Access through gates | Gradual separation | Cubicle or deep litter dairy barn






LESSONS LEARNED (2)

Farm	Milk			Milking frequency	
	Delivered, L	Consumed, L	Consumed, L / d	While suckling	While not suckling
Scotland					
Farm 1	2,000-2,300	1,500	10	1	1
Farm 2	4,000	2,000-2,500	11-14	1	2 -> 1
The Netherlands					
Farm 1	5,500-6,000	550-600	6-7	2	2
Farm 2	6,500	1,050	15	2	2
Farm 3	9,500	1,500-2,000	12-15	Robot	Robot
Farm 4	5,300	400	>7	2	2
Farm 5	5,600	1,200-1,400	14-16	2	2
Germany					
Farm 1	2,000	2,000	22	1	1
Farm 2	3,600	1,600	15-16	1	2

*Averages as assessed by the farmer. Average for females is shown when different for males.

Notes from visits

Amounts consumed depends on
- Length of dam-rearing period
- Time together per day
- Milk yield per cow

Selected points from farmers
- "Calves can drink 20 L / d if allowed"
- "Milk let-down can be an issue"
- "First year was horrible, second year cows had learned"
- "Calving management is important"

However
- Most farms are relatively small
- Most have relatively low yield
- Most farm include side businesses

BRIDGING LESSONS LEARNED IN DENMARK

Dialogue with farmers
- Inspiration catalogue
- Farmer field schools
- Interviews with farmers
- Farmers trialling solutions

Research in Denmark
- On-farm research
- Experimental farm research
  - Fulltime/parttime
  - Separation
- Modelling
  - Sustainability
  - Economic analysis

Science collaboration
- EU CORE Organic
  - GrazyDaisy
  - ProYoungStock
- National projects
  - Norway
  - Sweden
  - The Netherlands
  - Scotland
  - Germany
  - ...

Aim: Support informed investment decisions

FINAL POINTS & WAYS FORWARD

- Several farmers throughout Europe have years of experience with dam-rearing
- Some research over the years
- Study farms trialling dam-rearing
- More research is needed to
  - Investigate optimal length of dam-rearing
  - Find feasible combinations and ways of separation and weaning
  - Investigate feasible barn layouts
  - Investigate economic consequences of dam-rearing

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