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Group housing of calves

Introduction

Under natural conditions, the mother-calf pair reintegrates with the herd a few days after calving. Thereafter, interactions between calves increase and mother-calf distance increases gradually. During this period, calves establish long-lasting bonds with conspecifics.

On most dairy farms, calves are separated from their mother shortly after birth and often kept in individual pens or hutches, mainly to reduce the risk of disease transmission. The early dam-calf separation followed by social isolation are known to have negative impacts on calf welfare: such conditions increase calf reactivity and decrease social and cognitive abilities.

Group housing of calves has benefits for health, behaviour, welfare and performance, compared to individual housing regarding. Nevertheless, if not managed adequately, this practice presents some risks e.g. risk of disease transmission and competition between calves.

Legal requirements

Council Directive 2008/119/EC of 18 December 2008 lays down minimum standards for the protection of calves.

> 'no calf shall be confined in an individual pen after the age of eight weeks'
> (Article 3, Paragraph 1)

Method for inspection

When calves are group housed, it is necessary to monitor risks by observations of calves and their environment and asking information from the farmer.

Animal-based indicators for calves:

- Body condition score
- Injuries
- Behaviour (e.g. social play, stereotypies)
- Clinical signs of diseases

Environment-based indicators:

- Cleanliness of the pen and equipment
- Quality of the bedding
- Food and water access

Information to ask the farmer includes:

- Cleaning protocol
- Mixing and weaning practices
- Feeding practices
- Calf mortality records

In the present ***Indicator factsheet***, the indicators to be used during inspections are described. For more information on benefits and risks associated with group housing in calves see ***Thematic factsheet 'Group housing of calves'.***

For more information about individual housing of calves see ***Thematic and Indicator factsheets 'Visual and tactile contact in individually housed calves'.***

For more details about feeding practices see ***Thematic and Indicator factsheets 'Frequency and quantity of milk feeding to dairy calves'*** and ***'Colostrum provision to calves'.***

Information/indicators to check successful group housing

Environment and management-based indicators

This assessment should ensure that risks associated with group housing (disease transmission, competition for resources, cross-sucking) are mitigated, and that calves benefit from the advantages of group housing (e.g. positive social contacts). It is important to check if the calves' environment is hygienic and comfortable (Table 1), that the resources (food, water, bedding and space) are easily accessible by calves (Table 2), and that calves are adequately managed (Table 3). In the following tables Grade 1 corresponds to the best practice.

Table 1: Environment-based indicators for a healthy and comfortable environment

Pen cleanliness			
Directive 2008/119, Annex I, Paragraph 9*: 'Housing, pens, equipment and utensils used for calves must be properly cleaned and disinfected'*			
Is the pen clean? (e.g. presence of manure on pen walls) (From Heinemann et al., 2021)	Grade 1	*'No soiling is visible'*	☐
	Grade 2	*'Minor soiling is visible'*	☐
	Grade 3	*'Major soiling is visible'*	☐

Cleanliness of the feeding and watering equipment			
Directive 2008/119, Annex I, Paragraph 9: *Contamination of the calves' feed and water must be minimised*. *'(…) equipment and utensils used for calves must be properly cleaned and disinfected'*			
Is the feeding equipment clean? (e.g. presence of dirty food) (adapted from Renaud et al., 2017)	Grade 1	*'Feeding equipment is visibly clean (i.e., no faecal material or milk/colostrum residue)'*	☐
	Grade 2	*'Trace amounts of manure, milk/colostrum residue, or both, are visible'*	☐
	Grade 3	*'Manure contamination, milk/colostrum residue, or both, is extensive'*	☐

Bedding quality			
Directive 2008/119, Annex I, Paragraph 10: *'The lying area must be comfortable, clean, and adequately drained (…). Appropriate bedding must be provided for all calves less than two weeks old.'*			
Is the bedding clean, dry, comfortable and sufficient for all calves?	Grade 1	Bedding is deep, clean and dry	©PEXELS/RALPH, R. ©INRAE/MEUNIER, B. ☐
	Grade 2	The floor is covered by deep bedding, slightly wet or soiled, or sparse in places.	©SLU/STAAF LARSSON, B. ©UNSPLASH/HAMIL, D. ☐
	Grade 3	The floor is covered by rubber or by bedding material in small quantity or wet/soiled material	© UNSPLASH/ASHISH, N. © BOKU/GRÖSSBACHER, V. ☐
	Grade 4	There is no bedding material (e.g. bare concrete, slatted floor or muddy soil), resulting in calves being potentially wet and/or dirty	©UNSPLASH/BARRETT, R. SLU/STAAF LARSSON, B. ☐

Table 2: Environment-based indicators to check the ease of access to resources

Space availability			
Directive 2008/119/EC, Article 3: *'(b) for calves kept in groups, the unobstructed space allowance available to each calf shall be at least equal to 1,5 m^2 for each calf of a live weight of less than 150 kilograms, at least equal to 1,7 m^2 for each calf of a live weight of 150 kilograms or more but less than 220 kilograms, and at least equal to 1,8 m^2 for each calf of a live weight of 220 kilograms or more.'*			
Unobstructed space allowance	Grade 1	> 20 m²/calf	☐
	Grade 2	> 3 and ≤ 20 m²/calf	☐
	Grade 3	≥ 1.8 and ≤ 3 m²/calf	☐
	Grade 4	< 1.8 m²/calf (minimal legal requirement for calves ≥ 220 kg)	☐
Food access			
Directive 2008/119/EC, Annex I, Paragraph 12: *'Where calves are housed in groups and not fed ad libitum or by an automatic feeding system, each calf must have access to the food at the same time as the others in the group.'*			
Can all calves in the group access food at the same time? (e.g. Is there at least one teat dispenser per calf?)	Grade 1	Yes (1 bucket/calf) ©BOKU/GRÖSSBACHER, V.	☐
	Grade 2 (not considered as sufficient)	No (e.g. 3 buckets for 4 calves) ©BOKU/GRÖSSBACHER, V.	☐
Water access			
Directive 2008/119/EC, Annex I, Paragraph 13: *'All calves over two weeks of age must have access to a sufficient quantity of fresh water or be able to satisfy their fluid intake needs by drinking other liquids. However, in hot weather conditions or for calves which are ill, fresh drinking water must be available at all times.'*			
Duration when water is available	Grade 1	24 h/day	☐
	Grade 2	≥ 12 and < 24 h/day	☐
	Grade 3	≥ 6 and < 12 h/day	☐
	Grade 4	< 6 h/day (inadequate)	☐
Number of water points per animal	Grade 1	≥ 1/20 calves	☐
	Grade 2	< 1/20 calves	☐
Lying area access			
Size of bedded lying area	Grade 1	≥ 2 m²/calf	☐
	Grade 2	≥ 1 and < 2 m²/calf	☐
	Grade 3	< 1 m²/calf	☐

Table 3: Management-based indicators for a healthy environment, adequate access to resources and adequate group management

Healthy environment	**Pen hygiene**			
	Directive 2008/119/EC, Annex I, Paragraph 9: *'Housing, pens, equipment and utensils used for calves must be properly cleaned and disinfected to prevent cross- infection and the build-up of disease-carrying organisms. Faeces, urine and uneaten or spilt food must be removed as often as necessary to minimise smell and avoid attracting flies or rodents.'*			
	Is the pen emptied and disinfected regularly between batches of calves?	Grade 1	Yes	☐
		Grade 2	No	☐
	What is the pen cleaning protocol?		...	
			(e.g. *'removing bed material and thoroughly washing and disinfecting pens in-between calves'*, EFSA, 2023)	
	What are the cleaning practices of feeding equipment?		...	
Resources access	**Feeding practices**			
	Directive 2008/119/EC, Annex I, Paragraph 12: *'All calves must be fed at least twice a day.'*			
	How many milk meals/day?	Grade 1	>2	☐
		Grade 2	2	☐
		Grade 3	< 2 (insufficient feeding practices: minimal legal requirements demand at least two meals/day)	☐
	What is the maximum interval between two meals	Grade 1	< 8 h	☐
		Grade 2	≥ 8 h and ≤ 12 h	☐
		Grade 3	> 12 h	☐
	See Indicator factsheet ***'Frequency and quantity of milk feeding to dairy calves'*** for more questions on feeding routine to ask the farmer			
Group management	**Group stability**			
	What is the frequency of changes to group composition?	Grade 1	'all-in, all-out'	☐
		Grade 2	Changes to group composition	☐
	Age of grouping individually housed calves			
	What is the age of the calves when grouped?	Grade 1	The calves are grouped within the first week of life	☐
		Grade 2	The calves are grouped after one week old	☐
		Grade 3	The calves are grouped at 8 weeks old (minimal legal requirements)	☐
	Weaning practices			
	Duration of the weaning process	Grade 1	≥ 2 weeks	☐
		Grade 2	< 2 weeks	☐
		Grade 3	No gradual weaning	☐
	When does weaning begin (in weeks)?	Grade 1	≥ 12 weeks of age	☐
		Grade 2	≥ 8 and < 12 weeks of age	☐
		Grade 3	< 8 weeks of age	☐

Animal-based indicators

Appropriate resource access and group management can also be assessed by inspecting calves and observing their behaviour (Table 4). Substantial amount of observation is necessary to obtain information on behaviour. We suggest observing calves for at least 20 min at a time when most of them are active. Longer observation would increase reliability of the collected information. Clinical signs of diseases can be investigated to check that the risk of disease transmission has been adequately addressed (Table 5).

Table 4: Animal-based indicators for adequate resource access and group management (grades' thresholds are inspired by the Welfare Quality® protocol (2023))

Appropriate feeding			
Grades of body condition score Coat condition Body posture when standing Behaviours indicating hunger	See Indicator factsheet '***Frequency and quantity of milk feeding to calves***' for definition and gradation		
Bedding quality			
Calves' cleanliness	See Indicator factsheet '***Frequency and quantity of milk feeding to calves***' for definition and grades of calves' cleanliness		
Injuries (from Welfare Quality®, 2023) (percentage of animals injured)			
Injuries can be assessed observing the lesions (i.e. *'damaged skin either in form of a scab or a wound')* on all calf body. As an example, *'bitten tail and/or ear is defined as damaged tail/ear with/without presence of fresh blood or scab (individual level: present or absent)'*	 © Welfare Quality®	Grade 1 Grade 2 Grade 3 Grade 4	< 1% ≥ 1 and < 4% ≥ 4 and ≤ 8% > 8%
Social behaviours (from Welfare Quality®, 2023) (percentage of animals expressing social behaviour)			
'Social licking: licking, nibbling and sniffing a pen mate at the part of the body where the hair is long: head, shoulders, flanks, back and tail but not the lower parts (legs, under the belly)'	 © INRAE/BRUNET, V.	Grade 1 Grade 2	Behaviour observed Behaviour not observed
'Social play: Play activities performed in physical contact with another calf (relative to standing calves only)' (e.g. galloping, kicking, chasing…)		Grade 1 Grade 2	Behaviour observed Behaviour not observed
Abnormal behaviour (from Welfare Quality®, 2023) (percentage of animals expressing abnormal behaviour)			
'Cross-sucking: Calf is sucking the udder-region or the scrotal area or any other body part of another calf'	 © INRAE/MEUNIER, B. ©BOKU/GRÖSSBACHER, V.	Grade 1 Grade 2	< 5% ≥ 5%
'Tongue rolling: Calf makes repeated movements with its tongue in or outside its mouth'	 © PEXELS/MACOURT, H.	Grade 1 Grade 2	< 10% ≥ 10%
'Manipulating substrates: Calf licks, sucks or bites at the fence, wall, bucket, trough, floor or any other non-food and inanimate object'		Grade 1 Grade 2	< 10% ≥ 10%

Table 5: Animal-based indicators for a healthy environment. Grades are defined based on % calves affected (from Welfare Quality®, 2023). Grade 1 corresponds to the best practice.

Coughing (percentage of animals coughing)			
'A calf making audible expulsion of air from the mouth'	Grade 1	0%	☐
	Grade 2	> 0% and ≤ 6%	☐
	Grade 3	> 6% and ≤ 12%	☐
	Grade 4	> 12%	☐
Abnormal breathing (percentage of animals presenting abnormal breathing)			
'A calf performing belly movements, respiratory frequency > 40/min, pumping, excessive nasal movements, and an overall generalised 'sick' appearance. An increased breathing rate under heat stress is not considered here'	Grade 1	0%	☐
	Grade 2	> 0% and ≤ 4%	☐
	Grade 3	> 4 and ≤ 7%	☐
	Grade 4	> 7%	☐
Nasal discharge (percentage of animals presenting nasal discharge)			
'Obvious visible drops from the nostrils; transparent to yellow/green and often with a thick consistency; obvious because the calf does not lick its muzzle'	Grade 1	0%	☐
	Grade 2	> 0% and ≤ 6%	☐
	Grade 3	> 6% and ≤ 13%	☐
	Grade 4	> 13%	☐
Diarrhoea (percentage of animals presenting diarrhoea)			
The presence of diarrhoea can be observed on all individual calves (percentage of calves presenting liquid manure).	Grade 1	0%	☐
	Grade 2	> 0% and ≤ 5%	☐
	Grade 3	> 5% and ≤ 10%	☐
	Grade 4	> 10%	☐
Obviously sick calves (percentage of animals obviously sick)			
'An obviously sick calf is defined as an apathetic calf and/or an animal showing hanging ears and/or a body position indicating pain (e.g. rounded back).'	Grade 1	0%	☐
	Grade 2	> 0% and ≤ 5%	☐
	Grade 3	> 5% and ≤ 10%	☐
	Grade 4	> 10%	☐
Mortality			
Calf mortality recorded on the farm in the last year	Grade 1	0%	☐
	Grade 2	> 0% and ≤ 2%	☐
	Grade 3	> 2% and ≤ 4%	☐
	Grade 4	> 4%	☐

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