

Litteraturstudie	Ansvarlig	PRA
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		1 af 17

**Den Europæiske Landbrugsfond for Udvikling af Landdistrikterne:
Danmark og Europa investerer i landdistrikterne**



Se EU-Kommissionen, Den Europæiske Landbrugsfond for Udvikling af Landdistrikterne

Litteraturstudie

I vidensgrundlaget i udviklingen af anbefalinger for optimal indretning og brug af sygeafsnit indgår bl.a. et litteraturstudie, hvor tidligere publiceret viden om indretning og brug af sygeafsnit indsamles og vurderes.

Indsamling af litteratur: Hovedparten af den fundne litteratur er fremkommet ved en søgning i den videnskabelige søgedatabase Web of Science med følgende søgekriterier:

sick OR hospital OR recovery

AND

dairy

AND

pen OR area OR facility

Refined by: WEB OF SCIENCE CATEGORIES: (AGRICULTURE DAIRY ANIMAL SCIENCE OR FOOD SCIENCE TECHNOLOGY OR VETERINARY SCIENCES) **AND LANGUAGES:** (ENGLISH)

Søgningen resulterede i 141 artikler publiceret i tidsrummet 1994-2017. Artiklerne blev herefter først manuelt sorteret på baggrund af relevant overskrift og dernæst sorteret i forhold til relevant indhold i abstracts. Desuden er indhentet en videnskabelig rapport fra DCA Foulum, en bacheloropgave samt en Kvæginform om behandlingsafsnit. I alt er der fundet 14 relevante publikationer (Tabel 1)

Konklusion:

I langt hovedparten af danske besætninger er der indrettet faciliteter til syge køer og de anvendes i vid udstrækning. Der er dog stor variation mellem besætninger, når det kommer til hvilke lidelser, der medfører at køerne kommer i syge-boks. Desuden vurderer mange landmænd, at de har for få pladser i sygeboksene og at sygeboksene burde være indrettet bedre.

Enkelte undersøgelser har vist at risikoen for smittespredning er stor i sygeafsnit og at køernes adfærd bl.a. er afhængig af de fysiske rammer samt af flokstørrelsen.

Der er således et udtalt behov for at udvikle anbefalinger for indretning og brug af sygeafsnit for at kunne minimere smittespredning samt give de syge køer optimale betingelser for reconvalescens.

Tabel 1. Sammendrag af relevante publikationer, der danner en del af baggrundsviden for udvikling af anbefalinger for optimal indretning og brug af sygeafsnit.

Reference	Egen interpretative summary	Abstract/Summary
Vokey et al., 2001. Effects of Alley and Stall Surfaces on Indices of Claw and Leg Health in Dairy Cattle Housed in a Free-Stall Barn. J. Dairy Sci. 84:2686–2699	Har ikke direkte noget med sygebokse at gøre. Men den viser på side 2692 en tabel med hvor mange køer fra hver gruppe der tilbragte tid i sygebokse, samt dennes periode ift. Liggeunderlag og gulvmateriale i hele stalden.	A 15-wk 2 x 3 factorial trial in a university dairy herd compared the effects of two alley surfaces and three free-stall beds on indices of lameness. Alley surfaces were grooved concrete (Ct) or 1.9-cm-thick interlocking rubber mats (R). Stalls were deep sand (S), rubber mattresses (M), or concrete (C). Mattress and concrete stalls were bedded with sawdust. At wk 1 and 15, the hind claws and hocks of 120 primi- (n = 69) and multiparous (n = 51) cows were scored for lesions and three claw measurements (dorsal wall length, heel depth, and toe angle) were recorded. Rates of lateral and medial claw growth and wear were calculated by measuring the migration of a reference mark away from the coronet. Digital photographs of claw surfaces were used to rescore claw lesions. Clinical lameness was evaluated by assigning a locomotion score from 1 to 4 to each cow during wk 1, 5, 10, and 14. Digital dermatitis (present/not present) and interdigital dermatitis (mild, moderate, or severe) were recorded at wk 15. The number of days that cows spent in a hospital barn was recorded. Before assignment, cows were professionally foot trimmed, sorted by initial claw lesion score, and then randomized in consecutive blocks of three to stall treatments. Photograph scores were

		<p>highly repeatable. Nonparametric statistical techniques were used for analyses of rank data. Claw lesion score increased significantly for all treatment groups except RC and RS; however, when early lactation cows were excluded, no differences were found between treatment groups. Hock scores increased significantly more for cows in CtC than in CtS or RS. Significantly more animals from RC spent more than 10 d in the hospital pen compared with RM and RS. Groups did not significantly differ for clinical lameness. Cows in RS and RC had significantly lower rates for lateral claw net growth than those in CtM. Having moderate or severe interdigital dermatitis at wk 15 was associated with greater increases in claw lesion score and more treatments for digital dermatitis. All claw measurements were correlated; however, toe angle was most strongly correlated with the other two. In this experiment, stall and alley configurations did not lead to significant differences in several indices of lameness.</p>
<p>Holm, A.M. 2011. Behandlingsafsnit. KvægInfo - 2237</p>	<p>Behandlingsafsnit</p>	<p>Interessen for klovbeskærings- og behandlingsboks, som en fast bestanddel af stalden, er øget, idet det giver kvægbruger og dyrlæge mulighed for let og hurtigt at undersøge en ko, tjekke yver, løfte et ben eller for dyrlægen at operere en ko. Kombineret med gode drivveje gør det håndteringen af dyrene let, sikker og effektiv. Med indførsel af "Obligatorisk sundhedsrådgivning" er der nu flere dyr, der skal undersøges ad gangen, og med "Lov om hold af kvæg" er der krav om til enhver tid, at det skal være muligt at løfte en klov samt eventuelt at behandle en ko med klovproblemer.</p> <p>På baggrund af dette resulterede innovationssamarbejdet med Seem Staldinven-</p>

		<p>tar A/S i udvikling af en "konceptløsning" til et behandlingsafsnit i stalden. Konceptløsningen består af fastdefinerede dimensioner, lågetyper og inventar – som alt sammen kan leveres af Seem Staldinventar.</p>
<p>Punyapornwithaya, V.; Fox, L. K.; Hancock, D. D.; et al. 2011. Incidence and transmission of Mycoplasma bovis mastitis in Holstein dairy cows in a hospital pen: A case study PREVENTIVE VETERINARY MEDICINE, 98: 74-78</p>	<p>Køer med M. bovis mastitis kan introducere og sprede M. bovis til andre køer i sygeboks.</p>	<p>The objective was to determine the incidence and transmission of mycoplasma mastitis in the hospital pen in a dairy herd of 650 lactating cows after a hospital pen was established following an outbreak of this disease. Mycoplasma mastitis status was monitored for 3 months through repeated collection of milk samples from cows with clinical mastitis (CM) and from bulk tank milk. During the outbreak 13 cows were diagnosed with Mycoplasma bovis CM, 1 cow with Mycoplasma sp. mastitis and 8 cows showed signs of arthritis, 3 of which were confirmed as having M. bovis arthritis. M. bovis isolates from cows with CM, arthritis and bulk tank milk had indistinguishable chromosomal digest pattern fingerprints. Incidence rates of M. bovis CM cases in the milking and hospital pens were 0.01 and 1.7 cases per 100 cow-days at risk. Approximately 70% of cows with M. bovis CM became infected within 12 days of entering the hospital pen. Transmission of M. bovis in the hospital pen occurred as 3 episodes. Each episode corresponded to the introduction of a cow with M. bovis CM from a milking pen. Evidence indicates that cows with M. bovis CM from milking pens were the source of transmission of the disease in the hospital pen and thus their presence in the hospital pen appeared to be a risk factor for transmission of M. bovis mastitis in this single case study herd. (C) 2010 Elsevier B.V. All</p>

<p>Houe, H., Forkman, B., Williams, C. A., Jensen, M. B., Herskin, M. S., & Thomsen, P. T. (2014). Kortlægning af forekomst, udformning og anvendelse af sygebokse i danske malkekvægsbesætninger.: delafrapportering for projektet: Anvendelse af sygebokse og kvantificering af haltekørs behov i relation til velfærd, Videncenter for Dyrevelfærd.</p>	<p>Konklusion: Ca. en femtedel af malkekvægsbesætninger havde ikke enkeltsygebokse, ca. en tredjedel havde ikke fællessygebokse til køerne og ca. 10 % havde hverken enkelt- eller fællessygebokse til køerne. Flere besætninger, der ikke har sygebokse til kalve (22%) og kvier (24%). Der var ret store variationer i de fysiske mål på sygeboksene, hvilket muligvis kan være et udtryk for at man ofte anvender ”de forhåndenværende søms princip” når man etablerer en sygeboks mere end man bruger standardiserede anbefalinger</p>	
<p>Proudfoot, K. L.; Jensen, M. B.; Weary, D. M.; et al. 2014. Dairy cows seek isolation at</p>		<p>Dairy cows are typically gregarious, but isolate themselves in the hours before calving when kept on pasture. Self-isolation is also a common behavior of ill ani-</p>

calving and when ill. J DAIRY

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97: 2731-2739

mals. The objectives of this study were to determine if dairy cows would (1) isolate to calve when housed indoors in an individual maternity pen and (2) continue to isolate when ill after calving. We selected individuals from a pool of 79 multiparous Holstein dairy cows based on inclusion criteria created to address each objective. Cows were moved from a group pen to 1 of 10 adjacent maternity pens. Half of these individual pens were partially covered with plywood, creating a secluded corner as well as a window that provided visual access to the group pen. The other individual pens were uncovered on all sides. For our first objective, we selected 39 cows that were moved into the maternity pens >8 h before calving (partially covered: n = 19; uncovered: n = 20). For our second objective, we selected 18 cows housed in the partially covered pens: 9 cows with high rectal temperature after calving and signs of an infectious disease (mastitis, metritis, pneumonia, or some combination), and 9 healthy cows paired with ill cows based on the amount of time they spent in the maternity pen before calving. Ten-minute scan sampling was used to record the location and lying time from 6 h before to 72 h after calving. Individual feed intake was measured after calving. Binomial tests were used to determine if cows in both pen types were more likely to calve in the corner or window side of the pen. Repeated-measures ANOVA were used to determine if cows used the corner more as calving approached and if ill cows spent more time lying or more time in the corner compared with healthy cows in the 72 h after calving. Cows in the uncovered pens were equally likely to calve on both sides of the pen (10 vs. 10), but 79% of cows in the partially covered pens calved on the corner side of the pen (15 vs. 4). Cows in the partially covered pens used the corner side of the pen more in the 1 h before and after calving

		<p>compared with those housed in the uncovered pens. Ill cows housed in the partially covered pens ate less, tended to spend more time lying down, and spent more time in the corner of the pen compared with healthy cows. These results indicate that periparturient dairy cows seek seclusion to calve and when ill, which suggests that adding a secluded area to maternity and hospital pens may be beneficial.</p>
<p>Raundal et al., 2014. Effect of housing lame cows in recovery pens (<i>not published</i>)</p>	<p>Der var ingen forskel i liggeadfærden mellem halte og raske køer, når de var opstaldt i aflastningsboks, mens der ved opstaldning i sengebåseafsnit var tydelig forskel. Der var ingen tydelige forskel i halthedsgraden ved opstaldning i aflastningsboks vs. i sengebåseafsnit.</p>	<p>Lameness is associated with pain and discomfort and has major economic impact in the dairy production. However, there is only limited information on how to house lame cows in order to alleviate pain and discomfort. Therefore, we aimed at investigating the effects of housing lame cows in recovery pens compared to housing in a larger free stall pen on lying behavior, lameness score (LS), and mechanical nociceptive threshold (MNT). As a secondary aim, we investigated the performance of a hand-held device for MNT-testing. At day -1, we selected 24 unilaterally lame Danish Holsteins (later excluding 2) with a diagnosed foot lesion and matched each lame cow with a non-lame control cow without any diagnosed foot lesion. Each pair was randomly allocated to treatment: recovery pen with straw bedding together with another pair or in a 49 cows free stall pen for the treatment period day 1 to 21. The lying behavior was continuously recorded throughout the treatment period. Once a week, the cows were lameness scored and had their MNT measured at the dorsal aspect of the cannon of both hind legs by using a hand-held methodology. Using the difference within pair as outcome for lying behavior, the total lying time did not differ between lame and control cows ($P = 0.3$) and was not modulated by treatment ($P = 0.2$). In the free stall pen, the lame cows had fewer daily lying bouts ($P = 0.02$) of longer duration</p>

		<p>($P < 0.001$) than control cows. However, in the recovery pen, lying bouts frequency and lying bouts duration did not differ between lame and non-lame cows ($P = 0.3$ and $P = 1$, respectively). The effect of treatment on frequency and duration of lying bouts were significant ($P = 0.006$ and $P < 0.001$, respectively). For lame and for control cows we found no effect of treatment on the change within cow in LS between day -1 and day 21 ($P = 0.2$ and $P = 0.5$, respectively). No association between LS and MNT was found using the hand-held methodology for MNT-testing as MNT [Newton, N] (\pmse) before the treatment period was 3.05 (± 0.36), 3.28 (± 0.39), and 1.64 (± 0.79) for LS 1, 4, and 5, respectively ($P = 0.2$). However, the reliability of the methodology was not significantly influenced by lameness status. The MNT increased over time for recovery housed cows (0.06 N/day, ± 0.01, $P < 0.001$) but not for free stall housed cows (0.01 N/day, ± 0.01, $P = 0.6$, with no effect of group (lame or control) ($P = 0.6$). The effect of treatment was significant ($P = 0.003$). The absence of difference in lying behavior between lame and control cows in the recovery pens indicates that discomfort related to lameness was reduced by housing in the recovery pens. Recovery housing did not reduce lameness score. However, this may be due to low number of cows in treatment groups. In conclusion, the impact of pain and discomfort due to lameness may be reduced by recovery housing.</p>
<p>M. B. Jensen, M. S. Herskin, P. T. Thomsen, B. Forkman and H. Houe. 2015. Preferences of lame cows for type of</p>	<p>Køerne kunne udover underlag (sand vs gummimåtter) vælge mellem at være tæt på eller længere væk fra en</p>	<p>To investigate preferences of lame cows for flooring and level of social contact, 37 lame, lactating dairy cows (diagnosed with sole ulcer or white line disease) were housed individually for 6 d in experimental hospital pens, where they could choose between 2 equally sized areas (6 m x 4.5 m) with either deep-bedded sand or a rubber surface. On both surfaces, cows could choose between 2</p>

<p>surface and level of social contact in hospital pens. J. Dairy Sci. 98:4552–4559</p>	<p>gruppe kvier ved siden af sygeboksen. Her valgte de fleste køer at opholde sig tæt ved kvierne og hvile sig så de stadig havde visuelt kontakt med kvierne.</p> <p>Derudover var der større forekomst af hudpleje på sig selv, når køerne var i båsen tættest på kvierne.</p> <p>Der var observeret længere liggetid og kortere ståtid i sandet.</p>	<p>equally sized areas either near or away from heifers in a neighboring group pen. Cows spent more time lying on the deep-bedded sand than on the rubber surface (870 vs. 71 min/d), whereas they spent less time upright (standing or walking) on the sand than on the rubber surface (180 vs. 319 min/d). In addition, cows spent less time self-grooming on the sand than on the rubber surface (2.2 vs. 4.7% of time spent upright). With regard to level of social contact, cows spent more time near the neighboring heifers than away from them; this was true both while lying (565 vs. 374 min/d) and upright (276 vs. 223 min/d). Self-grooming was seen significantly more near neighboring heifers than away from them (4.8 vs. 3.3% of time spent upright). When lying, cows more often positioned themselves in areas of the pen where they could maintain visual contact with neighboring heifers. Lamé cows with sole ulcers or white line disease preferred deep-bedded sand for lying, and preferred to perform self-grooming while on the rubber surface. Similarly, they preferred to lie and to perform self-grooming while positioned near animals in a neighboring pen. These results suggest that provision of a deep-bedded lying area in hospital pens is important to the welfare of lame cows. We found no evidence of isolation-seeking behavior in animals with these diagnoses (and no systemic symptoms) while they were kept in individual hospital pens. a</p>
<p>Schuetz, Karin E.; Huddart, Frances J.; Sutherland, Mhairi A.; et al. 2015. Effects of space allowance on the behavior and physiology of</p>		<p>Dairy cattle managed in some pasture-based systems, such as in New Zealand, are predominantly kept outdoors all year around but are taken off pasture for periods, especially in wet weather to avoid soil damage. The use of rubber matting for such stand-off practices is becoming more common to improve animal wel-</p>

<p>cattle temporarily managed on rubber mats. J. DAIRY SCI. 98: 6226-6235</p>		<p>fare, and our objective was to investigate the effects of different space allowances on cow behavior and physiology when managed temporarily on rubber mats during a weather-induced stand-off period. Thirty pregnant, nonlactating Holstein-Friesian dairy cows were divided into 6 groups of 5 and exposed to 6 treatments following a Williams designed 6 x 6 Latin square. The treatments consisted of 6 space allowances on a 24-mm rubber surface during a simulated weather-induced stand-off period: 3.0, 4.5, 6.0, 7.5, 9.0, and 10.5 m²/co-w. The stand-off period consisted of 18 h in the treatment pens followed by 6 h at pasture to allow for their daily feed intake (no feed was available during stand-off, following normal farm practice), for 3 consecutive days, with 6 d of recovery on pasture between treatments. When cows had more space available during the stand-off period, they spent more time lying on the rubber mats and less time lying on pasture during their daily 6-h feed break. Mean lying times (24 h, pasture and rubber mats combined) for the different space allowances were for 3.0 m² = 7.5 h, 4.5 m² = 10.2 h, 6.0 m² = 11.9 h, 7.5 m² = 12.4 h, and 10.5 m² = 13.8 h. At 6.0 m² of space allowance per cow, the animals spent similar times lying per 24 h as when the cows were on recovery on pasture in between treatments (11.9 and 11.2 h, respectively). Aggressive interactions and nonaggressive lying disturbances were more frequent at lower space allowances (aggressive interactions decreased by 35% from 3.0 to 4.5 m²/cow, with a slower decline thereafter). Cows were dirtier after the stand-off period, particularly at lower space allowances. All cows had higher gait scores after the stand-off period; however, this change was unaffected by space allowance and very minor. Stride length, plasma cortisol, and body weight were all unaffected by the stand-off period and</p>
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		<p>space allowance. The results suggest that to reduce aggressive behavior and maintain adequate lying times, dairy cattle managed temporarily on rubber matting for up to 18 h per day, without feed, should have a space allowance of at least 4.5 to 6.0 m² per cow.</p>
<p>Anne Jul Andersen. 2016. Brugen af sygeboksen i danske malkekvægsbesætninger. Bacheloropgave, AU-Foulum.</p>	<p>Undersøgelse om hvordan sygebokse er indrettet og bruges af danske landmænd. (Minder om Anne's farmtest).</p>	<p>Fra den 1.juli 2016 indtræder der en ny lov, der øger kravet omkring antallet af sygepladser til 1 sygeplads pr. 100 årskøer. Sygeboksen har ikke altid været en integreret del af kvægstalden. Der er relevant at undersøge de danske malkekvægsbesætningers brug af sygebokse. Emner som boksens udformning og vedligeholdelse, smittebeskyttelse, management og håndtering af sygdomme, samt landmændenes vurdering herom bliver sat i fokus ved hjælp af en spørgeskemaundersøgelse, som er blevet besvaret af 345 danske mælkeproducenter. Af resultaterne fra spørgeskemaundersøgelsen bliver det belyst; om landmændene kan separere en ko fra, hvor mange der har en sygeboks, udformningen af den, og management omkring den. Ud fra resultaterne kan det konkluderes, at flertallet af landmændene er klar til, at den nye lov træder i kraft med 1 sygeplads pr. 100 årskøer. Det fremgår også af resultaterne, at sygeboksene er en blanding af enkelt- og fællessygebokse, som primært har dybstrøelse med halm, som oftest bliver rengjort ved udmugning. Det er under halvdelen af de deltagende landmænd som bruger sygeboksen til kortvarige ophold; såsom dyrlægeundersøgelse, inseminering osv. Til malkning i sygeboksen havde 77% af de adspurgte mulighed for dette, dog brugte mange sjældent denne løsning. Flertallet havde total adskilt syge- og kælvningsboksene, eksempelvis ved at have boksene pla-</p>

		<p>ceret to forskellige steder i stalden. Endvidere viste resultaterne omkring håndtering af sygdomme, at det oftest var dyr besværet ved fysisk bevægelighed, som blev prioriteret til flytning i sygeboks – sammenlignet med køer som havde reproduktionslidelser. Hovedparten af respondenterne tog beslutningen om koens flytning til sygeboks i løbet af dagen, og hos mere end halvdelen af de adspurgte, var det ejeren som var beslutningstager. Omkring kriterierne for en kos udtrædelse af sygeboksen var kriterierne normal gang og ædelyst højest prioriteret, efterfulgt af kriterier som normal gødning og feberfri. Til de køer der ikke havde et decideret behov for opstaldning i en sygeboks, havde mere end halvdelen af respondenterne et skåneafsnit, hvortil køerne kunne flyttes</p>
<p>Bak, A. S.; Herskin, M. S.; Jensen, M. B. 2016. Effect of sand and rubber surface on lying behavior of lame dairy cows in hospital pens. JDS, 99: 2875-2883</p>	<p>Køerne kunne vælge mellem 30 cm sand eller 24 mm gum-mimåtter. Der var længere liggetid og flere forskellige liggepositioner i sandet. Herudover tog det kortere tid for koen at rejse sig og lægge sig i sand.</p>	<p>Housing lame cows in designated hospital pens with a soft surface may lessen the pain the animals feel when lying and changing position. This study investigated the effect of the lying surface on the behavior of lame cows in hospital pens. Thirty-two lame dairy cows were kept in individual hospital pens, provided with either 30-cm deep-bedded sand or 24-mm rubber mats during 24 h in a crossover design. On each surface, the lying behavior of each cow was recorded during 18 h. On deep-bedded sand, cows lay down more and changed position more often than when housed on the rubber surface. Furthermore, a shorter duration of lying down and getting up movements and a shorter duration of lying intention movements were observed. These results suggest that lame dairy cows are more reluctant to change position on rubber compared with sand, and that sand is more comfortable to lie on. Thus, deep bedding such as sand may provide better lying comfort for lame cows than an unbedded rubber surface</p>

<p>Katrine K. Fogsgaard, Peter T. Thomsen, Anne J. Andersen & Anne B. Kudahl. 2016.</p> <p>A questionnaire survey on availability and management of hospital pens for Danish dairy cows. Proceedings, fourth dairycare conference, Lisbon, p. 21.</p>	<p>Samme survey som Anne Jul Andersen</p>	<p>Sick dairy cows may have different needs compared to healthy cows and may therefore benefit from a stay in a hospital pen. However, although the presence of hospital pens on Danish dairy farms is mandatory, little information about the availability and management of these hospital pens is available. The purpose of this study was, by use of a questionnaire-based survey, to provide descriptive information about availability and management of hospital pens on Danish dairy farms.</p> <p>The survey was emailed to 1296 dairy producers with an overall response rate of 24% including both conventional (88%) and organic (12%) farms with a median herd size of 150 cows (range 25 -1200). Almost all respondents (98%) had the possibility to move a sick or injured cow away from the milking herd. For 40% of the respondents the hospital area consisted of one or more single pens (for one cow), while 30% had group pen(s) and 30% had both. Among group pens 45% were designated hospital pens (as opposed to pens also used for e.g. calving). The most frequently cited conditions that would always result in moving the cow to a hospital pen were hip displacement (80%), milk fever (77%), displaced abomasum (65%) and severe cases of lameness (65%). However, large variation among which conditions would lead to the use of hospital pens was found between respondents. In 86% of the farms information regarding sick cows was passed on between employees in a systematic way (orally or written). There is a lack of specified scientific substantiated recommendations for farmers about the facilities and management of hospital pens. Therefore, respondents were asked to evaluate if they believed that number of hospital pens and the facilities in the hospital pens matched the needs of the sick and injured cows on</p>
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		<p>their farm. Surprisingly, 20% stated that their farm had too few pens and 36% found the facilities inadequate to fully match the needs of sick cows. This warrants for more scientific knowledge on the needs of sick cow in order to create evidence based guidelines for facilities and management of hospital pens.</p>
<p>Fogsgaard, Katrine K.; Herskin, Mette S.; Gorden, Patrick J.; et al. 2016. Management and design of hospital pens relative to behavior of the compromised dairy cow: A questionnaire survey of Iowa dairy farms. APPLIED ANIMAL BEHAVIOUR SCIENCE, 175: 50-55</p>	<p>Spørgeskema undersøgelse for landmænd omkring indretning og brug af sygebokse i Iowa. (Tænker at Anne's farmtest er bedre).</p>	<p>Compromised dairy cows, such as those suffering from illness or injury, are likely to have different behavioral priorities and needs compared to healthy cows. Although hospital pens are typically required in animal welfare standards and assessment programs, there is surprisingly little information on best practices for housing and management of compromised cows. The purpose of this study was to provide descriptive information about management and husbandry practices of compromised cows on dairy farms in Iowa. A questionnaire-based survey was designed to examine demographic information, design and management of hospital pens, as well as decisions concerning humane endpoints when euthanasia is considered. The survey was sent to 300 Iowa dairy farmers including organic, large (>500 cows) and ordinary (<= 500 cows) dairy farms, with overall response rate of 41%. Eighty-two percent of respondents had the possibility to house a sick or injured cow away from her normal pen. Hospital areas typically involved pen housing (89% of farms), and bedded pack was the most common flooring used (88%). Compromised cows were frequently housed in the same enclosure as fresh cows (45%), calving cows (36%), close up cows that are soon to calve (35%), dry cows (15%), or other cattle (8%), including heifers, calves and bulls. Half of the farms had standard management protocols for non-ambulatory cows. Calving difficulties, injury, milk fever, lameness and displaced abomasum were</p>

		<p>the most frequently cited conditions for moving cows into hospital pens. The present data can be used to formulate hypotheses and design experiments in order to examine relationships between the behavior of compromised cows under different management strategies. Research is needed to formulate recommendations for effective design and management of special needs areas and hospital pens, notably with respect to social groupings and behavioral needs of ill and injured cows</p>
<p>Houe, H.; Thomsen, P. T.; Amdi, C.; et al. 2016. Availability and use of designated hospital pens in Danish dairy herds ANIMAL WELFARE, 25: 69-71</p>	<p>Samme som ovenfor</p>	<p>The objective of this study was to describe the availability and use of designated hospital pens in Danish dairy herds and to analyse the association between availability and use of hospital pens and the herd-level incidence of reported disease treatments. Hospital pens were divided into either 'individual hospital pens' designed for only one animal or 'group hospital pens' designed for two or more animals. Questionnaires were sent to 350 dairy cattle herd owners. These questionnaires focused on four animal categories: dairy cows, heifers, males six months or older, and calves younger than six months. Depending on the category of animal, between 50 and 82% of the herds had access to individual hospital pens and between 39 and 65% of the herds had access to group hospital pens. Between nine and 24% of the herds did not have access to any type of hospital pens. The availability of hospital pens was generally higher for dairy cows than the other animal groups. There were significantly more reported treatments for hoof/leg disorders in herds with one or more cows in hospital pens at the day of visit.</p>

<p>Jensen, Margit Bak; Proudfoot, Kathryn, 2017. Effect of group size and health status on behavior and feed intake of multiparous dairy cows in early lactation J. DAIRY SCI, 100: 9759-9768</p>	<p>Opstaldning I mindre enheder (under 6 køer/gruppe) er bedre end opstaldning I større enheder (24 køer/gruppe)</p>	<p>Dairy cows in early lactation are often housed in a large group, where they may have to compete for access to feed and space. However, a cow's ability to compete may be impaired due to production disease, and housing in a small group with minimal competition may be beneficial for cow welfare. The aim of this study was to investigate the effect of group size and health on social and feeding behavior of cows during the first 3 d after introduction to a new group. Data included 54 multiparous Holstein-Friesian cows that were moved from an individual maternity pen and individually joined an existing group pen for 6 (N6) or 24 cows (N24) on d 4 after calving. Cows were considered sick if they were diagnosed with and treated for milk fever, mastitis, or retained placenta, diagnosed with subclinical ketosis or metritis within 3 d of calving, or were diagnosed and treated for any other infection (n = 22; balanced across treatments). Stocking density of both pens was 100% at the feeding and lying areas. Behavioral data were collected from video recordings during the 1 d after introduction to the group pen, as well as via electronic feed bins and leg-attached accelerometers during the first 3 d after introduction to the group pen. No interactions between health status and group size were discovered. During the 1 d after introduction, N6 cows displaced other cows from feed less frequently than N24 cows (1.22 vs. 5.76 times/24 h), were less likely to access feed after a displacement (replacement; 0.29 vs. 1.67 times/24 h), and were less frequently being butted by another cow (0.42 vs. 1.69 times/24 h). Second-parity cows received more head butting than later-parity cows. Data obtained from feed bins showed that the number of replacements</p>
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		<p>peaked on d 2 after introduction to the group pen. During the first 3 d we observed no effect of group size on DMI, but sick cows ate less than cows that were not sick (15.2 vs. 16.6 kg of DM/d). However, cows in N6 visited the feeder less often (42.4 vs. 55.6 times/d). Over the 3 d after introduction DMI and feeding time increased, whereas feeding rate decreased. Lying time and the number of lying bouts increased from d 1 to 2. The number of steps decreased over days, but the number of steps was higher among N24 than N6 cows on d 1 and d 2. Results suggest that cows experience less competition when moved to a smaller group after calving regardless of health status. Thus, minimizing competition by housing dairy cows in a small group for the first days after calving may improve cow welfare under commercial conditions</p>