

# **ANIMAL BEHAVIOR AND ENVIRONMENTAL CONSIDERATIONS: COW NEEDS AT CALVING VS. WHAT SHE GETS**

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## **THE TRANSITION PERIOD**

The transition period, the 3 weeks before and 3 weeks after calving, is a very crucial phase for a cow as what happens in this period can affect her throughout her whole next lactation. Although there is a large body of research that provides recommendations on what a cow needs in terms of housing and management during the transition period, data on what is actually being provided to cows on commercial dairies is lacking.

## **LYING TIME**

With years of research and improved technologies available on commercial farms, understanding all the factors that affect cow lying time and behavior has become easier, but it is still a challenge. Every cow is unique and has different time requirements and they can change based on her health status, production level, lameness status, stage of lactation, and management and facility factors. Lactating cows consider lying down a high priority behavior and they spend an average of 11-12 hours/d lying down (Munksgaard et al., 2005; von Keyserlingk et al., 2012). In the close-up period, cows spend an average of 12-14 h/d lying down, but this decreases as calving approaches. Lying behavior is important to consider throughout the whole lactation as it can be an indication of potential health and lameness issues and that management and facility improvements are needed. Specifically, cows with severe hoof lesions in the first few months of lactation or cows diagnosed as clinically ketotic between 2-21 DIM had higher standing times in the close-up period compared to healthy cows (Proudfoot et al., 2010; Iltle et al., 2015).

## **STALL DIMENSIONS AND STALL BASE**

The main facility factors that affect lying time and cow comfort during lactation and the transition period are stall dimensions and stall base. Since cows are larger as they approach calving, the stalls need to be designed accordingly to maximize lying time and allow the cow to stand with 4 feet in the stall. The most recent recommendations for mature close-up cows include a stall width of 50 inches and a neck rail 50 inches above the stall base and 70 inches from the rear curb. The use of brisket boards is not encouraged, but if they are necessary they should be 70 inches from the rear curb and no more than 4 inches above the stall base (Dairyland Initiative). Deep-beds are recommended as a stall base in the transition period. Lying time is

higher and lameness and injuries are lower on deep-beds compared to mattresses and mats (Chapinal et al., 2012; Barrientos et al., 2013; Ito et al., 2014).

## STOCKING DENSITY

During the transition period, it is recommended to maintain a stall stocking density at or below 100%, with an ideal density of 80% (Dairyland Initiative). For bedded-packs, transition cows should be provided at least 120-150 sq. ft. of bedded and feeding space (Dairyland Initiative). Overcrowding in the lactating pens can reduce lying time (Fregonesi et al., 2007), reduce milk production (Bach et al., 2008), reduce milk fat percentage (Hill et al., 2006), and compromise reproduction (Scheffers et al., 2010). Although there is less research on the negative impacts of overcrowding during the transition period, initial data suggests it may lead to reduced production in the upcoming lactation (Gary Oetzel, U of WI), dirtier cows, and higher SCC (Kentucky extension). Additionally, transition cows should be provided with at least 30 inches of linear feed bunk space, compared to the 24 inches recommended for lactating cows. When close-up cows are not provided with enough feed bunk space it can lead to increased competition (Proudfoot et al., 2009), reduced DMI (Ken Buelow), and increased risk of DA (Cameron et al., 1998). Lastly, all cows, including transition cows, should be provided with at least 3-3.5 inches of linear water space in the pen and there should be more than one trough per pen (Dairyland Initiative). There is a tendency for higher milk production when more water space is provided in lactating pens (Sova et al., 2013), and anecdotal evidence suggests more water in the close-up pen can lead to increased DMI.

## HEAT ABATEMENT

Some of the most important places to implement heat abatement strategies on farm include the maternity and close-up pens. The multiple benefits of providing fans and sprinklers in the close-up pen include reduced standing time, increased rumination time, increased DMI, increased feed efficiency, and increased milk production in the next lactation (Karimi et al., 2015).

## GROUPING STRATEGIES

It is recommended that heifers and mature cows are housed separately throughout the transition period as heifers are more negatively impacted by overcrowding and competition. However, due to herd size and facility design, this is not always possible. When co-mingling heifers and mature cows ensure that there is adequate resting, feeding, and water space, and the stalls are designed to fit the largest animals in the pen.

## PEN MOVES

Each time a cow is moved to a new pen it can disrupt the social order of the group. The negative effects of regrouping can be seen for 1-3 days after the move and include increased competition and feeding rate, and reduced production, DMI, and rumination time (von Keyserlingk et al., 2008; Schirmann et al., 2011). Therefore, close-up pens that have weekly pen moves or use an all-in-all-out system are much preferred to pens that have cows entering on a daily basis. Additionally, cows should not be moved to a new pen in the 7 days before calving, except to a calving pen. To help reduce the impacts of regrouping move cows during quieter times of the day (not at peak feeding time), move cows with a companion, and do not overcrowd the pens.

Moving a cow to the calving pen is a Goldilocks situation – don't move her too early or too late. Evidence suggests that cows that spend more than 3 days in the calving pen have higher NEFA's and are at a greater risk of ketosis and DA's after calving (Gary Oetzel, U of WI). In contrast, moving cows too late (once she has started calving, but before feet are visible) can lead to reduced lying time at calving and prolonged stage II labor which has been associated with dystocia (Schuenemann et al., 2011; Proudfoot et al., 2013). It is therefore suggested to move cows to the calving pen between 12-48 hours before calving or at the earliest signs of calving.

## CALVING PEN

The calving pen should contain clean and dry bedding, a headlock or gate to facilitate handling if necessary, and it should provide at least 140-200 sq. ft. of space per cow. More recent research has suggested cows may prefer some form of seclusion or privacy to calve (Proudfoot et al., 2014). Producers are coming up with creative ways to offer privacy in calving pens through the use of temporary plastic walls, plywood, and curtains.

## SUMMARY

Research has highlighted the importance of large, well-bedded stalls, low stocking density, adequate heat abatement, and limited pen moves throughout the transition period. Although commercial farm data is lacking, it is known that management is also key. By implementing the factors summarized above and with the right management, a successful transition program can be achieved in various ways and in various types of facilities.

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