

# Do your free stalls measure up?

Today's high-producing cow needs a clean and comfortable place to rest. You can use this flowchart to analyze your stalls from a cow's perspective.

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**S**HORTFALLS in free stall design have long been significant risk factors for mastitis, lameness, and other injuries to cows. These problems are a direct result of dirty stalls, hard and rough stall surfaces, and incorrect location of divider bars.

There are many reasons that problem free stall barns exist. First, it has only been in the past 10 to 15 years that free stall design has focused on cow comfort and the actual space a cow needs to lie down and get up. This evolution of stall design has led to many different stall types. Some require cows to lunge into a stall on either side of them; others force cows to lunge directly in front of them. Also, the addition of thick mattresses and the removal of loose bedding can cause dramatic changes in the distance between the stall surface and divider rails. These changes can turn a good free stall design into a cow comfort disaster.

Due to the wide variety in stall designs and the broad range of cow and heifer body sizes, we developed a comprehensive stall evaluation system based on the cow's functional needs. This system was developed from watching a cow as she lies down, rests, rises, and leaves the stall. The system focuses on the following areas:

1. comfortable stall surface cushion
2. adequate body resting space
3. lunge room for her head to thrust and an unobstructed "bob-zone"
4. sufficient height below and behind neckrail

When looking at **stall surface cushion**, the surface must be comfortable enough to attract a cow to lie down in the stall, rather than elsewhere. In our opinion, the surface cushion is the single most important factor when determining free stall usage. Lying times in free stalls of 14 hours per day have been reported for deep straw beds, in contrast to only seven hours per day on unbedded concrete. The surface should be soft and moldable from front to back. Many mistakes in stall design can be tolerated if the bed is soft and comfortable.

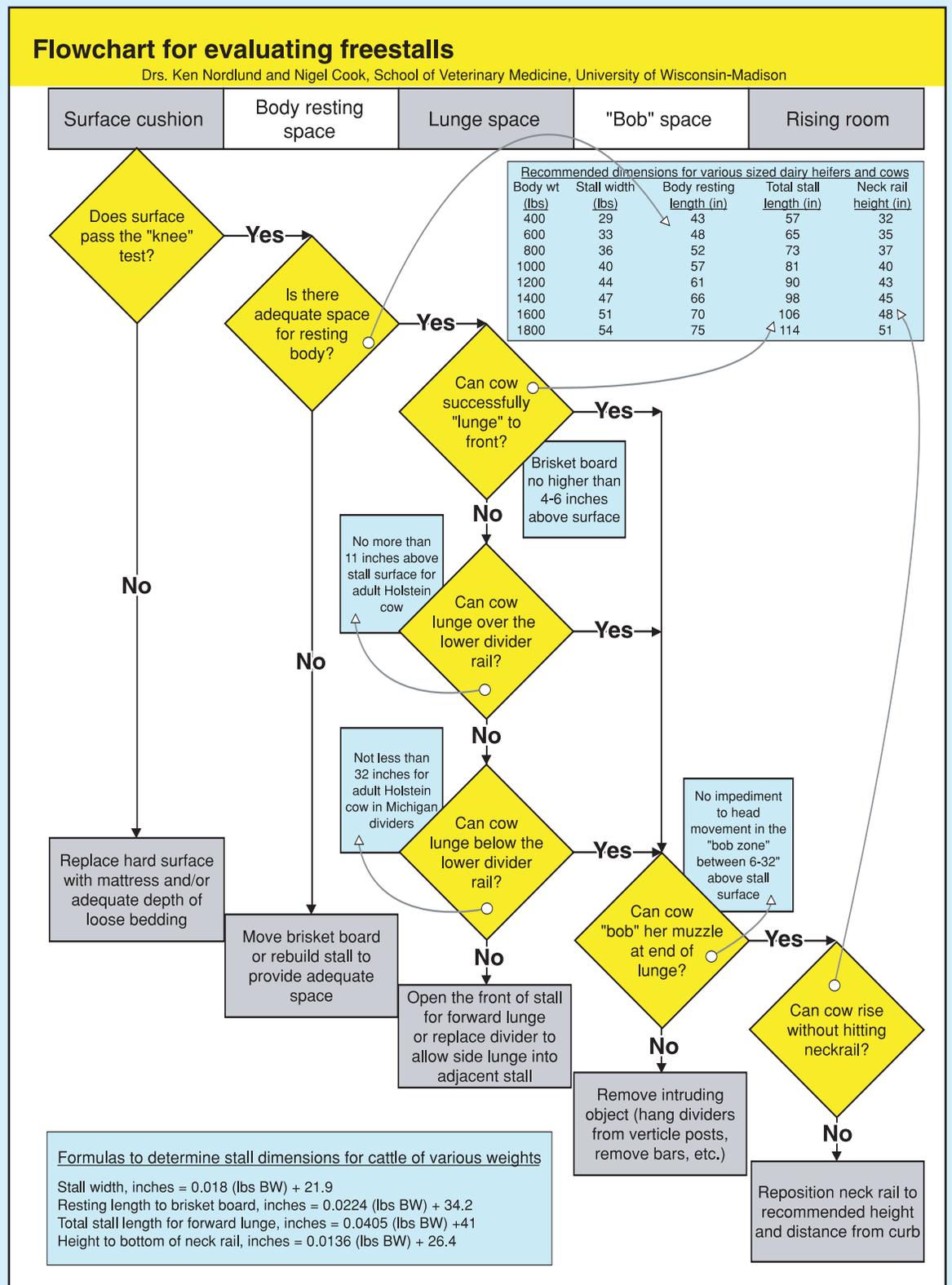
A good way to check your surface cushion is to use a "knee test." First, the surface should mold to your knee as you kneel in the stall, and your knees should stay clean and dry. If they do, you can then rise slightly from the kneeling position and drop to your knees to see how soft the stall really is.

Sand is our preferred bedding material. Organic material such as wood shavings, sawdust, or straw works well in terms of comfort, but they will support bacterial growth if moisture is present, raising the risk for mastitis.

The next area to look at is the stall size. Is it large enough to provide **adequate resting space** for the cow? Defining the resting space in the front of a stall with a bricket-board helps to position the cow properly in the stall, reducing fecal contamination and lowering the chance of the cow getting trapped in the stall. The resting space is actually the area between the stall divider rails from the rear of the stall to where the stall surface meets the bricket board. This does not include the space needed for the cow's head or for lunging to get up.

Stall dimensions should be based on estimated cow size within the herd because there can be a wide variation among herds. The stalls should be fitted to the largest 25 percent of animals in a pen. The typical resting space in new barn construction today is 48 inches wide and 66 inches in length which will accommodate 1400-pound cows. You

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can refer to the chart above to get specific stall dimensions.

**"Lunge and bob" room** is the next critical factor when designing "cow-friendly" stalls. When cows stand up, they rise with their rear legs first. However, there are several important steps that happen first. A cow will first pull her front legs underneath her and elevate herself on her front "knees." She then lunges forward and "bobs" her muzzle downward, transferring the weight forward using her knees as a fulcrum. Then she is able to get up using her rear legs. She completes the motion by extending her front feet and then balancing her weight.

If a cow is unable to rock forward to lunge and bob, her rear legs must lift more weight. The inability to transfer weight from the rear legs, combined with a slippery stall, cause a variety of problems to cows housed in these stalls.

The final point is adequate **room to rise below**

**the neckrail without obstruction.** The neckrail acts to provide structural support for the dividers, and they also help position the cow while she is standing in her stall so that she does not soil it with urine and feces. The neckrail provides the most structural support when it is placed as far toward the rear of the stall as possible. However, the more the neckrail is moved to the rear of the stall, the more it interferes with cow entry and exit, resulting in cows standing half-in and half-out of the stalls.

When a bricket board is used, the neckrail should be directly above the board or further toward the front. If the rail has a shiny rubbed under surface, it is incorrectly located. Cows are frequently hitting the rail when they get up.

By using the accompanying flowchart, you can easily evaluate your free stall design. Then, you can see what's working well and what isn't and start to make the appropriate changes.