



NUTRITION NOTES

Innovation + Research from Kent Nutrition Group

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COWS, LIKE US, RESPOND TO LIGHT

It dawned on me this week that I seldom see the sun any more. It is dark when I drive to the office in the morning and dark when I drive home at night. In between, seems like it is always overcast. As I drive by dairy barns along the way, I can see lights on, but I know that most are not lit very well. Research tells us that these poorly lit barns are having a negative impact on milk production.

Managing dairy cow's exposure to light can increase milk production. Photo-period is the duration of light exposure during a 24-hour period. Cows continuously exposed to light for 16-18 hours followed by 6-8 hours of darkness on average produce 5 more pounds of milk per day than cows exposed to light for shorter periods of time. To produce an effect, the light must have a minimum intensity of 15 footcandles (FC) measured three feet from the floor. A response has been observed at 10 FC, but the extra 5 provides a buffer for dirty bulbs. A dark period of 6-8 uninterrupted hours is also important. Darkness is measured as light intensity of less than 5 FC. Without darkness, cows do not respond to the 16-18 hr photo-period. The intensity of light can be easily measured with an inexpensive (\$75-\$100) light meter.

Light should be uniform throughout the entire barn. Often lights are put only over feed bunks. This is not effective, because cows normally will spend more time lying than eating. Recent recommendations suggest that for optimum production, cows should spend a minimum of 14 hours a day lying in comfortable free stalls. The higher the lights are hung, the greater their intensity must be to maintain 15 FC at 3 feet. When placed lower, more fixtures are needed to maintain uniform lighting and avoid spotlighting and dark spots. Photo cells can be used to turn lights on and off. These can be placed under an outside eave where sunlight provides the required 15 FC.

Mounting Height for Different Fixture Types

Lamp Type	Lumens	Mounting Height (ft)
Metal halide		
250 watts	20,500	14-24
400 watts	36,000	20-35
High-pressure sodium		
250 watts	27,500	14-24
400 watts	50,000	20-35

When additional lighting is provided to bring intensity up to 15 FC the response will not be immediate. It normally takes four weeks for cows to respond. Also, when cows are milked 3X it is important to keep 6 hours of below 5 FC darkness between milkings. Light effects cow hormone levels. As photoperiod increases, the level of melatonin decreases and the concentrations of prolactin and insulin-like growth factor 1 (IGF-1) change. It is believed that it is the relationship between prolactin and IGF-1 that increases milk production.

As we make farm calls, it would be a great idea to keep a light meter in our pocket or recommend that the dairy follow the above recommendations. A quick test or recommendation will create a teachable moment which could help our producers become more profitable.

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