

# Long-Day lighting in dairy barns

## Worth considering!

Most dairy barns are too dark. Improving your barn lights and operating them according to a specific schedule can improve both the profitability and working conditions on your dairy farm. This technique is known as **Long-Day Lighting** or **Photoperiod Control**. It has been well researched in the past 20 years. Benefits include:

- Increased milk production
- Improved heifer growth
- More enjoyable and safer working conditions

## A profitable investment

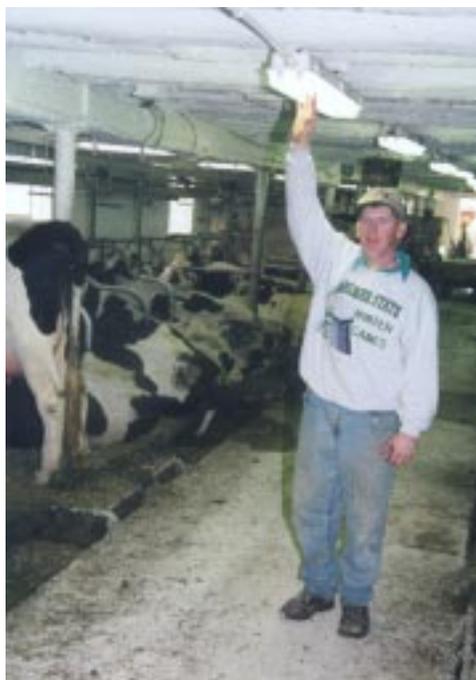
Studies have shown that exposing cows to supplemental light during the short days of fall and winter can increase milk production by about 5-16%. However, cows also eat more, and there is a cost to install and operate the lights. The increased milk yield pays for the extra feed and the cost of the lights - and still leaves a net profit. Estimated investment costs and pay-back periods for lights in a 40 cow tie-stall barn range from \$1,672 paid back in 111 days (Chastain, 1996) to \$2,125 paid back in 332 days (Stanisiewski and Tucker, 1986).

## Recommended light program:

**16-18 hours of light and 6-8 hours of dark per day.** Most of the experiments with Long-Day Lighting have provided supplemental light extending the fall/winter days (September - March/April) to 16-18 hours of light per day. The effects of this technique are well documented, and you can expect a substantial production increase by using a consistent program of 16-18 hours of light followed by 6-8 hours of darkness. Note that consistent night/off and early am/on timing is necessary to achieve an increase in milk production.

## A safer, more productive place to work

Trivial accidents (slips and falls) do happen during barn chores. They may be disabling



*Supplemental lighting: Profitable in any stall barn or freestall barn.*

and are occasionally fatal. Good lighting helps workers spot obstructions and slippery areas. Better lighting also makes it easier to notice cows in heat, health problems, cows off feed, low feed quality, etc. In addition, most people appreciate a well-lit work place and, consequently may become more productive.

## Improved lighting in conventional stall barns

Cows are stimulated to produce more milk when they register longer days through their eyes and brain. The average light intensity in the barn needs to be at least 15 foot-candles at cows' eye level. This can be achieved by installing sealed fluorescent light fixtures over the manger. You should avoid using incandescent lamps since they are not energy-efficient and have a short bulb life. In most stall barns, natural daylight is insufficient. Therefore, the manger lights need to also be on during the day. To ensure consistent light/dark periods, a timer should be installed.

**WORK  
EFFICIENCY**



**TIP SHEET**

Ideas for more efficient dairy farming.

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**Table 1: Estimated profitability of Long-day Lighting**

	50 cows <sup>1)</sup>	100 cows <sup>1)</sup>	150 cows <sup>2)</sup>	300 cows <sup>2)</sup>
Annual Profit per cow	\$62	\$62	\$67	\$67
Total Annual Profit	\$3,100	\$6,200	\$10,050	\$20,100

1) Cows housed in tie-stall barn with fluorescent lamps.

2) Cows housed in freestall barn with high pressure sodium lamps.

## Improved lighting in freestall barns

To stimulate milk production, provide an average of 15 (or more) foot-candles in all areas where cows spend time. Be sure to provide sufficient light also to outside freestall rows! Certain work areas (e.g. treatment, breeding, and feeding) require 20 or more foot-candles. Metal halide and high-pressure sodium lamps provide a high light output and have a long lamp life. Both represent energy efficient options for free stall barns. The amount of natural light in non-insulated, naturally ventilated freestall barns during daytime typically exceeds 20 foot-candles. Thus, the lights can normally be turned off for most of the day and operated only during early morning, late afternoon and evening hours. Install a timer to achieve consistent on/off times. A photo sensor should be installed to save energy during normal days, but automatically keep the lights on during exceptionally dark winter days.

## Appropriate for most dairy operations

Long-day Lighting is profitable and feasible for stall barns and freestall barns of all sizes.

Farmers should take advantage of this opportunity to improve profitability and working conditions.

## Use a light meter

A simple light meter can tell you whether the amount of light in your stall barn is too low. Measuring the light levels after the installation can verify that the new lights deliver the light levels required to stimulate milk production. Area utility company representatives and county agents may be able to assist with measuring light levels, or provide a light meter on a loan basis. Otherwise, a simple light meter can be purchased for \$100-150.

## More information

You can get more information on how to plan lighting in dairy barns by contacting your county extension agent.

*This material was developed by the Wisconsin Healthy Farmers, Healthy Profits Project, whose goal is to find and share work efficiency tips that maintain farmers' health and safety and also increase profits. For more information, call (608)262-7408 or visit our website at <http://bse.wisc.edu/hfhp/>*

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**Work Efficiency Tip Sheet: Long-Day lighting in dairy barns**