

Lighting effects in dairy cow housing

- Reference information from CowPlan Ltd.
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Key points:

According to research, optimum photoperiod will increase milk yield by **6-13%** on average

- Eventually, cows increase feed intake to support the risen milk yield.
- No effect on protein or solids content while only a very limited decrease in fat content.
- The increase in milk yield amply compensates the effects on fat and feed intake.

Why is there an effect?

Light reception occurs in the eyes retina. Light inhibits an enzyme used in melatonin synthesis in the pineal gland. Therefore, as photoperiod increases, the duration of high levels of melatonin in the blood decreases. Melatonin concentration in the blood influences the concentration of some hormones in the blood, for example, insulin-like growth factor-1 (IGF-1). Scientists believe changes in the concentration of IGF-1 play a role in the effect of photoperiod on milk production, as IGF-1 has been shown to increase milk yield.

IGF-1 is basically growth hormone, which directly affects production of milk in the udder.

Why should we be concerned with this?

- The use of light is cost-effective and has a very short pay-back time.
- Very simple to carry out.
- No extra labor required.
- Improved production and therefore margins on the units we work with.

Requirements for lighting:

For milking cows, calves and heifers:

16 hour long day photoperiod; 150-200 lx at the eye level of the cow

8 hour of uninterrupted darkness means less than 5 lx* at the eye level of the cow

For approximately 3 months of the year:

16 hours long at less than 5 lx*.

8 hours of 150-200 lx

[this will reset the long-day photoperiod and improve the immunity system]

*5lx means that you can still see a printed text.

Red night lights may be used to facilitate cow movement and observation during darkness. This adheres to the dairy standards which state we must be able to inspect cows at all hours of the day and night. The red lights allow the operator to see, however the intensity of red light has no (or only minor) effects on the cows' perception of darkness, and thus melatonin secretion.

There should be no brighter lights in any part of the barn and cows need 2-4 weeks on average to adjust.