



LED and high-pressure sodium systems can yield a return on investment

# Let there be light

An enlightened approach to improving the cow house environment can pay dividends – and not just in terms of increased milk production. We spoke to two producers and two dairy consultants to find out more.

text **Rachael Porter**

Everyone performs better when the days start to lengthen and there are a few more hours of sunlight. And cows are no exception. Providing them with better, brighter lighting for at least 14 hours each day, during winter housing, can see more milk in the tank, as well as improved health, welfare and fertility. The cost of making the necessary

investment can hold some producers back – particularly during the current milk price squeeze – but those who took the plunge before the crash are pleased to report a rapid return on their investment.

Richard Adams runs a 155-cow herd at Gulpher Farm, near Felixstowe in Suffolk, and he installed LED strip lighting in his sand-bedded cubicle house

in October 2013. He and his consultant, Kite Consulting's Tanya Colman, are always looking at ways to improve herd performance and the pair agreed that the unit's somewhat gloomy shed was a limiting factor.

"We set out to try to mimic the light levels seen in high summer – about 16 hours a day – inside the cow house, with around eight hours of low-level light or darkness," explains Tanya.

Trials have shown that cows that are given 16 hours of light continuously each day will increase milk production by between 5% and 16% (an 8% response is typical) with feed intake up 6%. "And they will maintain reproductive performance, compared to cows receiving 13.5 hours of light or less. The response can take two to four weeks or longer to develop after installation, as long as nutrition and other management conditions are acceptable."

## Melatonin production

So how can light help to increase milk production? Researchers have found that when light hits a cow's eye, it signals the cow's body to produce less melatonin. When it is dark, melatonin is produced.



*Lighting solutions: a brighter house creates a better cow environment. And providing at least 180 lux for 14 hours a day can help to significantly increase milk yields*

Cows have an internal clock that is set by melatonin production. This internal clock affects the production of other hormones that impact milk production. Long-day lighting increases the production of IGF-I (insulin-like growth factor-I). IGF-I is the same hormone that is increased by bovine somatotropin (bST). More IGF-I production in the cow boosts milk production.

“Richard had heard about the benefits of improving lighting at an Arla workshop that he attended. And Kite also has plenty of data on this that shows that an additional 1,000 litres of milk per cow per lactation can be achieved just by improving lighting.”

She concedes that other management or cow factors could be at play where there’s any increase in milk production. “But we’ve certainly seen that much extra milk per cow per lactation from Richard’s herd since we installed the new lights and we know that nothing else has changed.”

“I’m certainly very pleased with the new lights – it was money well spent,” says Richard, who invested £11,000 and says he’s already had that back in extra milk and improved fertility. “Within two weeks, milk yields were up by 10%. We had a fantastic winter and, coupled with feeding a good ration, we actually saw yields increase by 15%.”

### **Lux level**

So, what’s so special about the LEDs? “It’s all about lux – we were aiming to achieve around 180 lux in all areas of the cow house and I bought a light metre to measure levels and make sure we didn’t have any dark corners,” explains Richard. “We didn’t quite manage 180 lux, but just about. Not bad for the amount we invested and the results speak for themselves.

During the winter, the lights are on for 16 hours a day and off for eight, although there are a couple of strategically placed ‘night lights’ in the shed, so the cows are never in complete darkness. The LED lights are on a timer to come on 30 minutes before the morning milking staff arrive, so the cows are already up and awake and ready to go.

“We can expect at least 10,000 hours from each strip – and they’re energy efficient lights too, using about 3kW.

And any power they do use is offset by our on-farm wind turbine. So it’s cheap electricity anyway,” he says.

It’s also had a surprising effect on staff: “My herdsman Steve says that when he walks into the lit shed he feels better too. It’s not dark and gloomy.”

### **Retina reaction**

DP Agri’s Rob Doran says that his company has installed a lot of new lighting systems in cow houses during the past two years. “And our customers have seen some fantastic results. That said, there are still a lot of units out there with inadequate and unsuitable lighting that will be impacting on herd productivity and profitability.”

He says that to achieve a minimum of 160 lux, LED or high-pressure sodium lights are the way to go. “The lights have to be bright enough to get the retina reaction that then has an effect on melatonin and, therefore, milk production.

“Producers must take advice before they buy. The wattage of LED lights varies and some may not be powerful enough to produce the high lux levels required to see an impact on herd performance. I have visited units where they have made little difference because they’ve not had enough oomph.”

That ‘oomph’ comes at a price: “And some producers may be put off by the cost of investing in top-quality lighting that’s going to provide at least 160 lux across an entire shed. But if they took a close look at the benefits – in terms of increased milk production and better health and fertility – they’d see that it would, in most cases, be money well spent.

One customer who installed high-pressure sodium lights in the cow house at his 250-cow unit is David Moore. He put up a new cow house for his herd, based at Woolsey in Devon, four years ago and took the opportunity to upgrade the lighting system. “I managed to get a 50% grant towards the cost of the lighting and I aimed for about 200 lux across the entire house,” he says.

Milk yields have improved to their current 8,500 litres, but he says that it’s difficult to say if it’s solely down to the lights because housing has been improved across the board. |

🔗 *Grants to help towards the cost of installing lighting are available. Visit <https://www.gov.uk/apply-for-a-grant-for-led-lights-for-livestock-housing> to find out more*