DairyLight increases yields and boosts profits

DairyLight LED light system regulates the Circadian Rhythm and Melatonin Secretion through its unique light spectrum.
Contents

Benefits for herds 4
What is DairyLight? 5
Specific light can affect life’s rhythms 6
Melatonin, Circadian Rhythm and Red Light 7
Alltech Report 8
Testimonials 9
DairyLight Ordering Process 10
DairyLight Proven Financial Benefits + Savings
(Results based on Alltech data from Courts Farm, Cheltenham)

+7.69%
Increased milk value per cow per year

+1.9p
Average Increased Price Per litre milk

£263
Impact on finances per cow

-11.43%
Electric use per litre(kWh/litre)

-11.43%
Total feed use per litre

-7.69%
Carbon Emissions Per litre
All round herd improvement using DairyLight

Production
- Typically achieves milk yield increases of between 8 – 11% with results independently verified by Alltech E-CO2
- Payback usually 4–7 months
- The first UK dairy lighting system providing the optimum spectrum of light scientifically proven to influence melatonin production in dairy cattle
- Bespoke installation design provided to ensure the required intensity of light is delivered
- Fully automated system to release manpower and minimise ongoing running costs

Breeding
- Improves cow fertility and shortens calving intervals
- Stronger and longer signs of heat and bulling

Wellbeing
- Summer-light conditions all year around benefits coats and general well-being
- Blue light has been shown to reduce fungal and bacterial load in the environment
What is DairyLight?

✔ DairyLight is:
A unique white, blue and red LED lighting system scientifically proven to enhance a cow’s performance and general well-being all year round.

✗ DairyLight is not:
A standard off-the-shelf white LED light. Standard white LED lights do not provide enough blue 450 NM light to replicate summer sunshine and will not provide red light for night time supervision.

- DairyLight systems include blue, white and red LED lights with timer
- Control day and night light timing
- Switch from blue & white daylight to red night light
- Daylight control saves electricity
- Systems can be installed by a qualified electrician or we can install for you. Call for further information
Specific light can affect life’s rhythms

**Built-in Body Clocks**

Research over the last decade has identified that specific light can affect and regulate the Circadian Rhythm and in turn Melatonin secretion and its effect on all mammals.

Often referred to as the "body clock," the Circadian Rhythm is the 24-hour cycle that tells our bodies when to sleep, rise, and eat — regulating many physiological processes.

**Types of light**

DairyLight delivers an optimized spectrum of light, at the right intensity to have a maximum effect on the Circadian Rhythm of the cow by regulating the secretion of Melatonin, also known as the sleep hormone.

Blue light within the short-wavelength blue light spectrum (465–485 nm) is the most effective at inhibiting Melatonin secretion, as Melanopsin production, its precursor is particularly sensitive to short wavelength, Blue Light.

Normal white LED or fluorescent lights do not deliver blue light at the level of intensity required to have any real effect on Melatonin suppression.

**Achieving Reaction Requires:**

1. The right spectrum of light
2. The right intensity of light
3. The right circadian rhythm of light & dark

The system works by exposing the dairy cattle to a specific level and spectrum of light for 16 – 18 hours. When installed according to our bespoke design, this specific level and spectrum of light is delivered by our unique DairyLights. Melatonin production is suppressed during this time and cow activity and efficiency is optimised. This is followed by a period of darkness (or near darkness) for 6 – 8 hours, during which time melatonin production is stimulated and the cows rest and recover.
Red Light Function

Red light does not inhibit Melatonin secretion and hence the Circadian Rhythm. The controller automatically switches the DairyLight to red during the ‘off’ phase, and thus will allow sufficient observational light at night without interfering with Melatonin secretion. This is useful for checking calving cows and bulling.

Red Light Spectrum

The diagram below demonstrates that red Light does not affect the Circadian sensitivity and can be turned on at night for supervision and observation.

Duration Of Light Exposure - The Natural Circadian Rhythm

In the northern hemisphere the daylight hours vary greatly between the summer months and the winter. For example in December we have 8 hours of daylight and 16 hours of darkness while in June we have the reverse with 16 hours of daylight and 8 hours of darkness.

The Physiology Of Melatonin Control Using Specific Blue Light With Correct Lux And Duration

Light enters through the retina of the eye and suppresses the release of Melatonin from the pineal glands, thus allowing the resumption of hormones to be released from the hypothalamus of the brain.
### Proven Results

**Alltech** Results based on Alltech data from Courts Farm, Cheltenham.

<table>
<thead>
<tr>
<th>Milk</th>
<th>Pre Installation Average</th>
<th>Post Installation Average</th>
<th>Change %</th>
<th>Financial Implementation £</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Milk Yield per cow per day</td>
<td>31.1</td>
<td>33.9</td>
<td>9.00%</td>
<td>230 * per cow</td>
</tr>
<tr>
<td>Milk Butterfat (%)</td>
<td>4.12</td>
<td>4.01</td>
<td>-2.67%</td>
<td>-</td>
</tr>
</tbody>
</table>

**Impact on carbon per litre BFC 4%** -36

<table>
<thead>
<tr>
<th>Replacement &amp; Culling</th>
<th>Pre Installation Average</th>
<th>Post Installation Average</th>
<th>Change %</th>
<th>Financial Implementation £</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herd Culling Rate (%)</td>
<td>52</td>
<td>52</td>
<td>0%</td>
<td>-</td>
</tr>
<tr>
<td>Heifer First Calving age (months)</td>
<td>27</td>
<td>27</td>
<td>0%</td>
<td>-</td>
</tr>
</tbody>
</table>

**Financial implication of adopting Post Installation Scenario** £53,195

| Impact on finances per litre p/litre                               | 1.9                      |                           |          |                            |
| Impact on finances per cow                                         | £265                     |                           |          |                            |
| Impact on carbon per litre BFC 4%                                  | -36                      |                           |          |                            |

<table>
<thead>
<tr>
<th>Crops &amp; Resource Use</th>
<th>Pre Installation Average</th>
<th>Post Installation Average</th>
<th>Change %</th>
<th>Financial Implementation £</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen Use per ha (kg N per ha)</td>
<td>105</td>
<td>105</td>
<td>0%</td>
<td>-</td>
</tr>
<tr>
<td>Diesel Use Per Cow (1 per cow)</td>
<td>126</td>
<td>126</td>
<td>0%</td>
<td>-</td>
</tr>
<tr>
<td>Electric Use Per litre (kWh per 1)</td>
<td>0.052</td>
<td>0.048</td>
<td>-7.69%</td>
<td>356 *per 1M litres</td>
</tr>
</tbody>
</table>

**Feed**

<table>
<thead>
<tr>
<th>Feed</th>
<th>Pre Installation Average</th>
<th>Post Installation Average</th>
<th>Change %</th>
<th>Financial Implementation £</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total feed use per litre (kg concentrate equivalent/litre)</td>
<td>0.35</td>
<td>0.31</td>
<td>-11.43%</td>
<td>9,870 *per 1M litres</td>
</tr>
<tr>
<td>Carbon Performance (g CO2e per litre BFC 4%)</td>
<td>941</td>
<td>904</td>
<td>-3.93%</td>
<td>-</td>
</tr>
</tbody>
</table>

**Financial implication of adopting Installation’ Scenario**

| Impact on finances per litre (p/litre)                             | £53,195                  |                           |          |                            |
| Impact on finances per cow                                         | £263                     |                           |          |                            |
| Impact on carbon per litre BFC 4% *Post                            | -36                      |                           |          |                            |
DairyLight Step-by-Step Ordering Process:

1. **Call +44 (0) 1285 411141**
   - for more information or complete the enquiry form at [www.dairylight.co.uk/process](http://www.dairylight.co.uk/process)

2. **We’ll arrange a site visit**
   - at your convenience to take all the necessary measurements.

   **Note:**
   - We don’t need to visit your site if your barn has recently been constructed - simply email us your architect’s plans.

3. **Plans will then be drawn up**
   - based on the site visit (or supplied architect’s plans).

4. **Our software will calculate the correct number of lights required to produce 200 Lux intensity.**

5. **We’ll then send you a quote**
   - based on the number of DairyLights you will need.

   **Note:**
   - Interest Free Payment options are available. Please call for more details +44 (0) 1285 411141.

6. **Once your order is placed**
   - the system will be delivered within 12-16 weeks.

   **Note:**
   - If you require us to install the system we can provide a cost for this too.
Installations & Testimonials
“Having had our high yielders done for a couple of weeks I would say we are so far definitely seeing very strong and long lasting heats compared to before.

Initial perceptions regarding milk yields are that high yielders have already increased by around a couple of litres, but it is difficult to isolate the results from the middle yielders due to other changes going on.”

David Irwin
Redhouse Holsteins, Armagh.
Herd 170, 13,500 litres.

“We’ve seen a lift in yields over the past 2 years - a definite 10% increase. Normally, there’s a drop in production in November, but we’ve seen an increase.

At first we were sceptical - we did half then decided to do the second half because of the results. Fertility has also been quite phenomenal - a big improvement.”

Geoff Spence
Miresdale Dairy, Northallerton
900 cows, 11,500 litres

“Apart from the great yield-response and benefits for the cows, we also had a great improvement in the working environment for the staff.”

Richard Davenport
Top of the Town Farm, Cheshire.
Herd: 500, 9000 litres.

“The lights have gained us another 2lt per cow per day and the bullying activity has moved to a different level to that experienced before.

I would definitely install the lights again knowing the benefits that have brought us.”

John Cartledge
Peaslow Farm, Buxton.
Herd: 230.

“Yields up probably 1+ lt per cow. Intakes up and herd are generally keener to be up feeding in the morning.”

Roger Mason
Heaves Farm, Cumbria.
Herd: 220.

“Overall milk yield from July 2017 to the same month last year is up 6%. Another improvement in the herd this year so far is a noticeable difference in the strength and length of heats in the animals. Our fertility figures have been slowly improving each year, but this year the rate of improvement has been better than usual.”

Chris Dorrington
The Old Rectory, Grantham.
Herd: 150, 9000 litres.

“9% yield increase, reduction in concentrate usage from 0.35 to 0.31kg/lt, improves margins by 1.8ppl for the year totalling £263 per cow.”

Calvin Pugh
Court Farm, Gloucestershire/Worcestershire.
Herd 200.
Our green technology reduces electricity use and CO₂ emissions

DairyLight’s advanced technology reduces the impact on the environment and still delivers a superior light. By using highly efficient LED-diodes we reduce the electrical usage and extend the working life with long-lasting high quality luminaries.

• We use highly efficient LED lamps that provide 130 lumens per watt - more light for less power.

• Light sensors can also be installed with the system that turns off the lights if the natural daylight exceeds 200 lux, which further saves power.

• Our high quality luminaires with an expected 50,000 hours life (L70 @ 40 deg. C) gives a longer life than standard luminaires.