Field Demonstrations:
Spanish heat stress demonstrations show the impact of Bovine BlueLite® Pellets on pregnancy rates and milk production.

During the summer months of 2015, two dairy field demonstrations were conducted in Spain. The objective was to document the effects of Bovine BlueLite® Pellets (BlueLite) on lactating dairy cows experiencing heat stress for an extended period of time. Analysis shows marked improvements in pregnancy rates and milk production. The methodology for both demonstrations was the same and outlined below. A pregnancy calculator created by the University of Wisconsin was used in this report to calculate economic value, and can help producers explore the value of pregnancy on their operation. Pregnancy rate is defined as the number of cows that became pregnant divided by the total number of cows eligible to become pregnant during each 21 day time period.

About the Demonstrations
Cows were managed in two groups – Control and Treated. Both demonstrations fed BlueLite to their Treated groups for 60 days at 4.5 oz/h/d (130 g/h/d) mixed into the TMR. Control groups did not receive BlueLite in their TMR. Cows were eligible for pregnancy if they had passed their voluntary waiting period. The last insemination date for pregnancy confirmation was 60 days after the demonstration ended. It should be noted that the summer of 2015 was a record hot summer in Spain – the hottest recorded over the last 100 years – with at least 3 sustained heat waves. Farm 1 was located in the region of Navarra and Farm 2 in Girona.

Farm 1
- 500 milking cow Holstein dairy with Lely robotic milker systems, averaging 81.7 lbs/c/d (37 kg/c/d) yearly
- Control Group: 119 cows - daily average (averaging 3.2 lactations)
- Treated Group: 122 cows - daily average (averaging 3.0 lactations)

Based on past dairy management records, the treatment group had historically shown the most negative response to heat stress. This group also had the best producing cows but housed in a building with inferior air flow compared to the Control group. Heat abatement with fans and sprinklers was provided for both groups. Temperature Humidity Index (THI) recordings were made every 20 minutes inside the barn with a data logger. During the 60-day period, the maximum THI recorded was 91 while the average of all daily maximum THI was 79.1.

<table>
<thead>
<tr>
<th>FARM 1</th>
<th>Control</th>
<th>BlueLite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement Period</td>
<td>Cumulative number of Pregnant Eligible Cows</td>
<td>Number that became Pregnant</td>
</tr>
<tr>
<td>6/15/2015 - 10/18/2015</td>
<td>251</td>
<td>32</td>
</tr>
<tr>
<td>BlueLite Advantage</td>
<td>+3.1 (percentage points improvement in Pregnancy Rate)</td>
<td></td>
</tr>
<tr>
<td>Avg. Days to Pregnancy</td>
<td></td>
<td>140.8</td>
</tr>
<tr>
<td>BlueLite Advantage</td>
<td>-8.0 (Days Open)</td>
<td></td>
</tr>
<tr>
<td>University of Wisconsin Madison - Preg Calculator</td>
<td>(click here for link: enter data on Economics tab, then review on Analyze tab)</td>
<td></td>
</tr>
</tbody>
</table>

Results
Milk production: Milk production of the Treated group for the entire trial period remained above the Control group by an average of +3.77 lb/day (1.71 kg/day).
Farm 2
- 400 milking cow Holstein dairy with parallel milking parlor, averaging 80 lbs/c/d (36.29 kg/c/d) yearly
- Control Group: 99 cows - daily average (averaging 2.5 lactations)
- Treated Group: 98 cows - daily average (averaging 2.4 lactations)

Both groups consisted of early and mid-lactation cows. No heat abatement equipment was available for either group. Temperature Humidity Index (THI) recordings were made every 20 minutes inside the barn with a data logger. During the 60-day period, the maximum THI recorded was 100 while the average of all daily maximum THI was 88.4.

Results
Milk production: Milk production of the Treated group for the entire trial period remained above the Control group by an average of +3.06 lbs/day (1.39 kg/day) during the 60-day trial (with a maximum of +8.60 lb/day (3.9 Kg/day) during the hottest period in July).

Conclusions
The data presented from these two farms suggest that feeding BlueLite® during periods of heat stress may support better reproduction rates and reduce milk production losses. It is known that heat stress triggers physiologic responses in the cow that can negatively affect conception and embryonic development, and the results of these demonstrations appear to be consistent with reducing the impact of heat stress.

The Bovine BlueLite® Advantage
Reproductive success is one of the key financial drivers of a dairy – and with the value of a pregnancy is generally considered to be greater than $300 dollars, every pregnancy saved and every reduction in days open can contribute significantly to a producer’s ROI.

BlueLite® is a palatable and buffered source of energy and electrolytes that provides the right nutrition at the right time to help recover from dehydration, boost cell hydration health, maintain electrolyte balance and support reproductive health for cows experiencing a stress event. TechMix recommends adding BlueLite to the TMR during the summer months as a nutritional solution to mitigating the effects of heat stress.

<table>
<thead>
<tr>
<th>FARM 2</th>
<th>Control</th>
<th>BlueLite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement Period</td>
<td>Cumulative number of Pregnant Eligible Cows</td>
<td>Number that became Pregnant</td>
</tr>
<tr>
<td>7/1/2015 - 11/3/2015</td>
<td>213</td>
<td>18</td>
</tr>
</tbody>
</table>

BlueLite Advantage +2.8 (percentage points improvement in Pregnancy Rate)

Avg. Days to Pregnancy 186.4 176.2

BlueLite Advantage -10.2 (Days Open)

University of Wisconsin Madison - Preg Calculator [click here for link: enter data on Economics tab, then review on Analyze tab]
Economic value of improving pregnancy risk from 8.5% to 11.3% is $83.38/cow/year. (**milk price: $13.70 per CWT)**

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