Calculating the Energy Requirements of Brood Cows in Cold Weather
(Frequently asked questions)

1) **How much do the energy requirements of cows increase during the cold weather?** This depends on the magnitude of the cold, and if it occurs under dry or wet conditions. See the calculations below.

**Under cold, dry conditions:**

Lower critical temperature for a brood cow is 32°F under dry conditions. Below 32°F, daily energy requirements begin to increase. For every degree that the wind chill is below 32°F, a cow’s energy requirement increases by 1% (NRC, 2000).

**Quick Math:**

1) Critical temperature is 32°F
2) Determine wind chill from weather report: Wind chill on Feb 11. in Auburn: 25°F
3) Calculate the magnitude of cold: 
   $$32 - 25°F = 7°F$$
4) Energy adjustment is 1% for each degree of difference

A **7% increase** in energy supply is needed to overcome loss from the cold.

**Under cold, wet conditions:**

Lower critical temperature for a brood cow is 59°F under wet conditions. Below 59°F, daily energy requirements begin to increase. For every degree that the wind chill is below 59°F, a cow’s energy requirement increases by 2% (NRC, 2000).

**Quick Math:**

1) Critical temperature is 59°F
2) Determine the wind chill from weather report: Wind chill on Feb. 11 in Auburn: 25°F
3) Calculate the magnitude of cold: 
   $$59-25°F = 34°F$$
4) Energy adjustment is 2% for each degree of difference
A **68% increase** in energy supply is needed to overcome loss from the cold.

2) **Will feeding more hay meet the energy demands of my cow herd during cold weather?**

Given the poor quality hay produced in 2013, it is likely that this will be insufficient to meet the energy requirements of a lactating brood cow under normal weather conditions (above 32°F). Even with increased dry matter intake (up to 30% more), energy requirements increase more than what can be supplied by low quality hay.

**Using our “quick math” from above:**

<table>
<thead>
<tr>
<th>1,200 pound brood cow, late lactation</th>
<th>Require 55% TDN, 9% CP</th>
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</thead>
<tbody>
<tr>
<td>Average quality hay from 2013: 48% TDN, 7% CP</td>
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<tr>
<td>Cattle will consume as much as 30% more dry matter during cold weather</td>
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3) **How can I overcome a large energy loss due to cold weather?**

Do not rapidly change to a high-energy diet. Diet changes should be made gradually over time. Instead, provide a digestible energy supplement (i.e. soy hulls, dried distiller’s grains with solubles, corn, etc.) along with free choice hay during and after the cold event. Feeding a supplemental energy source for 3 to 5 days after the cold weather can help overcome losses.

**References:**

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