

Determining Forage Increase Requirement for Cold Weather Feeding

The standard "critical temperature" is 45°F (7.2°C).

Actual temperature is thermometer temperature minus wind chill. *Subtract 10°F each for wind or rain/wet coat.*

Critical temperature minus the actual temperature = % increase in DE required.

For each 1°F decrease below the critical temperature, the horse requires a 1% increase in digestible energy [calories - DE or Mcals] to maintain a consistent body temperature.

Horse weight lbs **1000**
 Horse weight Kg **455**
you can change horse weight or DE of the hay (below)

NRC daily DE requirement in Mcals	1000 lb horse at regular maintenance													
	15.1 Mcal/day (15,100 Calories)													

Actual Temperature °F	45	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20
Actual Temperature °C	7.2	4.4	1.6	-1.1	-3.8	-6.6	-9.4	-12.2	-15	-17.7	-20.5	-23.3	-26.1	-28.8
Total Mcal needed	15.1	15.9	16.7	17.4	18.2	18.9	19.7	20.4	21.2	21.9	22.7	23.5	24.2	25.0
Mcal above base requirement		0.8	1.5	2.3	3.0	3.8	4.5	5.3	6.1	6.8	7.6	8.3	9.1	9.8
% increase in calories (DE/Mcal)		5%	10%	15%	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%

Grass hay with a DE of	0.8	Mcal/lb													
		18.9 lbs/day required for maintenance													
<i>lbs per day to increase above maintenance</i>	0.9	1.9	2.8	3.8	4.7	5.7	6.6	7.6	8.5	9.5	10.4	11.4	12.3		
<i>Total lbs hay to feed per day</i>	19.9	20.8	21.8	22.7	23.7	24.6	25.5	26.5	27.4	28.4	29.3	30.3	31.2		

Alfalfa hay with a DE of	1.2	Mcal/lb													
		12.6 lbs/day required for maintenance													
<i>lbs per day to increase above maintenance</i>	0.6	1.3	1.9	2.5	3.2	3.8	4.4	5.0	5.7	6.3	6.9	7.6	8.2		
<i>Total lbs hay to feed per day</i>	13.2	13.9	14.5	15.1	15.8	16.4	17.0	17.7	18.3	18.9	19.6	20.2	20.8		

Adding beet pulp (DE 1.2 Mcal/lb) can also improve internal heat production - this can be added instead of increasing hay ration

<i>lbs (dry weight) beet pulp to add</i>	0.6	1.3	1.9	2.5	3.2	3.8	4.4	5.0	5.7	6.3	6.9	7.6	8.2
<i>above basic hay ration</i>		<i>This is especially useful if your grass hay is lower than 0.8 Mcal/lb or you don't want to add excessive protein and calcium with alfalfa.</i>											

This is only a guideline; some "easy keepers" may require less, "hard keepers" or older horses may require more.

If your weather service provides an "actual" temperature which accounts for wind chill and humidity, use that for your actual temperature.

Links:

Adapted from "Cold Weather Feeding Practices for Horses" by Dr. Robert A. Mowrey,

Extension Horse Husbandry Specialist, North Carolina State University

NCSU Link [Cold Weather Feeding Practices for Horses](http://www.cvm.ncsu.edu/vhc/efac/equine/documents/ColdWeatherFeedingPracticesforhorse-B.Mowrey.pdf)

<http://www.cvm.ncsu.edu/vhc/efac/equine/documents/ColdWeatherFeedingPracticesforhorse-B.Mowrey.pdf>

Averages for grass hay, alfalfa hay and beet pulp are from the Dairy One Feed Composition Library

<http://www.dairyone.com/Forage/FeedComp/disclaimer.asp>