Estimating Hay Value Based on Chemical Analysis

Objective

The objective of this decision aid is to estimate the economic value of a hay sample based on the percent total digestible nutrients (percent TDN) and crude protein (percent CP) contents. The TDN and CP content of the sample hay are used in comparison to a reference-based hay of known TDN, CP and selling price. The value of energy and protein in the hay samples is calculated based on concentrate replacement cost of corn grain and cottonseed meal (CSM) for TDN protein sources. The price of sample hay is then adjusted based on the market value of the base hay.

The resulting value of the sample hay is an approximate value since it does not take into account any difference in the efficiency of protein or energy utilization between hays of various quality, or between hay and corn or cottonseed meal. The analysis will, however, calculate an estimated hay value, which can be used in buying, selling or utilizing hays.

Input

The chemical analysis for TDN and crude protein for both the base hay and sample should be entered in the appropriate columns. The selling price of a ton of the base hay, a bushel of No. 2 shelled corn (9% CP, 78% TDN), and a ton of cottonseed meal (40% CP, 68% TDN) should be entered in the appropriate columns.

Output

The value of the base hay and sample hay is calculated by computing the pounds and value of the corn and cottonseed meal necessary to replace the pounds of TDN and CP in a ton of hay.

A sensitivity table for different levels of sample protein level facilitates this. A bale weight conversion also facilitates calculation of hay value per bale.

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Formulas

Pounds CSM = Pounds TDN in Hay - (8.67 * Pounds Protein in Hay) / -2.874

Pounds Corn = Pounds TDN in Hay - (Pounds CSM *.68) /.78

Calculated Hay Value = Pounds CSM * (Price CSM - 2,000) + (Pounds Corn * Price Bu. Corn - 56)

The estimated value of the sample hay is calculated by adjusting the price of the base hay by the difference in calculated hay values above.

Difference in Hay Values = Calculated Value Sample Hay - Calculated Value Base Hay

Estimated Value Sample Hay = Base Hay Price + Difference in Hay Value

Definitions

Base Hay is a hay of known TDN, CP and selling price per ton.

Sample Hay is a hay of known TDN and CP content for which the program calculates the value.