

Hay Storage Cost Evaluator Decision Aid¹

One of the ways to minimize winter feeding costs is to establish proper hay storage. Round bales are often stored outside and unprotected because their shape enables them to shed precipitation. However, questions often arise concerning storage losses with exposed hay bales and the economic feasibility of providing some type of protection. The value of storage depends on the projected hay loss while in storage and the price of hay when sold or used. Dry matter losses alone can be severe and can reach 50%. Baled forages can benefit from protection while in storage.

Objective

This decision aid facilitates the evaluation of alternative methods of hay storage, namely, open storage, open storage with hay covered, and hay barn storage. Total storage costs include the cost of the storage system and losses in hay value during storage. Annual costs are calculated along with the discounted net present value of costs associated with the storage system.

Getting Started

Cells for data entry in the spreadsheet appear in blue on the screen. Cells with formulas for calculations by the program are protected so they cannot be accidentally overwritten.

Storage loss, quality loss and cost by storage system are found in three sections of input data for this analysis. Cells for data entry in the spreadsheet appear in blue on the screen. On the *Input Data* worksheet, enter:

1. General data on the amount and value of base hay.
2. Discount rate.
3. Nutrient levels, such as percent total digestible nutrients (TDN) and percent crude protein (CP), for base hay and hay under alternative storage systems.
4. The cost of a replacement energy source (for example, corn) and replacement crude protein source (for example, cottonseed meal) are also entered to calculate the value of nutrients lost during storage.

Initial investment and annual storage costs plus hay storage loss percentages (dry matter) by storage method are entered in the *Storage Investment* worksheet.

To test the sensitivity of the outcomes to price and quality assumptions, enter alternative values and study the results as the ten-year storage cost analysis does not account for changing costs, hay values or tax implications.

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Results

The *Analysis Summary* worksheet shows the net present value (NPV) of total costs by storage system. NPV is a capital budgeting technique that accounts for the time value of money in ranking investment alternatives. In NPV calculations, each projected income flow is discounted to its present value to account for the timing and magnitude of the cash flow. Here, the focus is on costs so the NPV interpretation is the expense of future storage in current dollars. Hence, the smallest negative number is the preferred investment.

The payback method is another approach to evaluate investment alternatives. The payback periods shown represent the time required to recover the differences in barn storage annual costs relative to the other storage methods. One major disadvantage of this analysis is that it does not measure profitability as it ignores time value of money and any benefits after initial outlays are recovered.

References

Huhnke, R.L. Round Bale Hay Storage. OSU Extension Fact Sheet BAE-1716, OSU Cooperative Extension Service, Oklahoma State University.
<http://factsheets.okstate.edu/documents/bae-1716-round-bale-hay-storage/>