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## Hay Inventory and Purchasing Calculator for Horse Owners

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## Hay Inventory and Purchasing Calculator for Horse Owners

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**Abstract.** The Hay Inventory and Purchasing Calculator for Horse Owners is an Excel-based tool for estimating hay needs and expenses for horse owners. Challenges with hay quality and availability can result in higher than expected costs for horse owners as they attempt to purchase enough horse-quality hay to meet their needs. Estimating intake requirements and creating a budget for hay purchasing is key for the effective management and profitability of equine operations. This tool can be used regardless of geographic location and will benefit a diverse audience including Extension educators, equine business owners, and horse owners.

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### INTRODUCTION

Equine digestive anatomy and feeding behavior require the presence of forages in the diet. Forages for horses in the United States include pasture, hay, and processed alternatives. The availability of forages can be affected by geographical region, weather, stocking density, and forage management. It is estimated that most adult horses eat 1%–2.5% of their body weight (BW) in forage daily. Breeding, growing, and working horses may need additional forage to meet dietary needs. When pasture is unavailable due to environmental or management conditions, hay is commonly used to meet nutritional requirements (National Research Council [NRC], 2007).

Because it is fed in such high quantities to meet dietary needs, hay can be one of the largest expenses associated with horse ownership. Therefore, it is important that horse owners be able to estimate their annual hay needs and budget appropriately, based on expected market value. The Hay Inventory and Purchasing Calculator for Horse Owners is an Excel-based tool for calculating estimated hay needs and expenses for horse owners in a given time period. The tool was developed by using standardized values set by the National Research Council's *Nutrient Requirements of Horses*, 6th edition (2007).

### HOW TO USE THE CALCULATOR

The Hay Inventory and Purchasing Calculator for Horse Owners can be downloaded for free as a supplemental material to this article or from the Lincoln County University of Georgia Extension WordPress site (<https://site.extension.uga.edu/lincoln/hay-inventory-and-purchasing-calculator-for-horse-owners/>). The tool is composed of one Excel Workbook with five sheets: Instructions, Herd Requirements, Annual Forage Intake, Annual Hay Needs, and Estimated Expenses. It is recommended that users download and save the tool to their computer for future use.

#### SHEET 1: INSTRUCTIONS

The first sheet, titled “Instructions,” gives a brief overview of the required program input data, information on how to use the calculator, and a disclaimer about the program's limitations (Figure 1). It is recommended that users read the instructions thoroughly and gather the required information prior to moving through the remaining sheets.

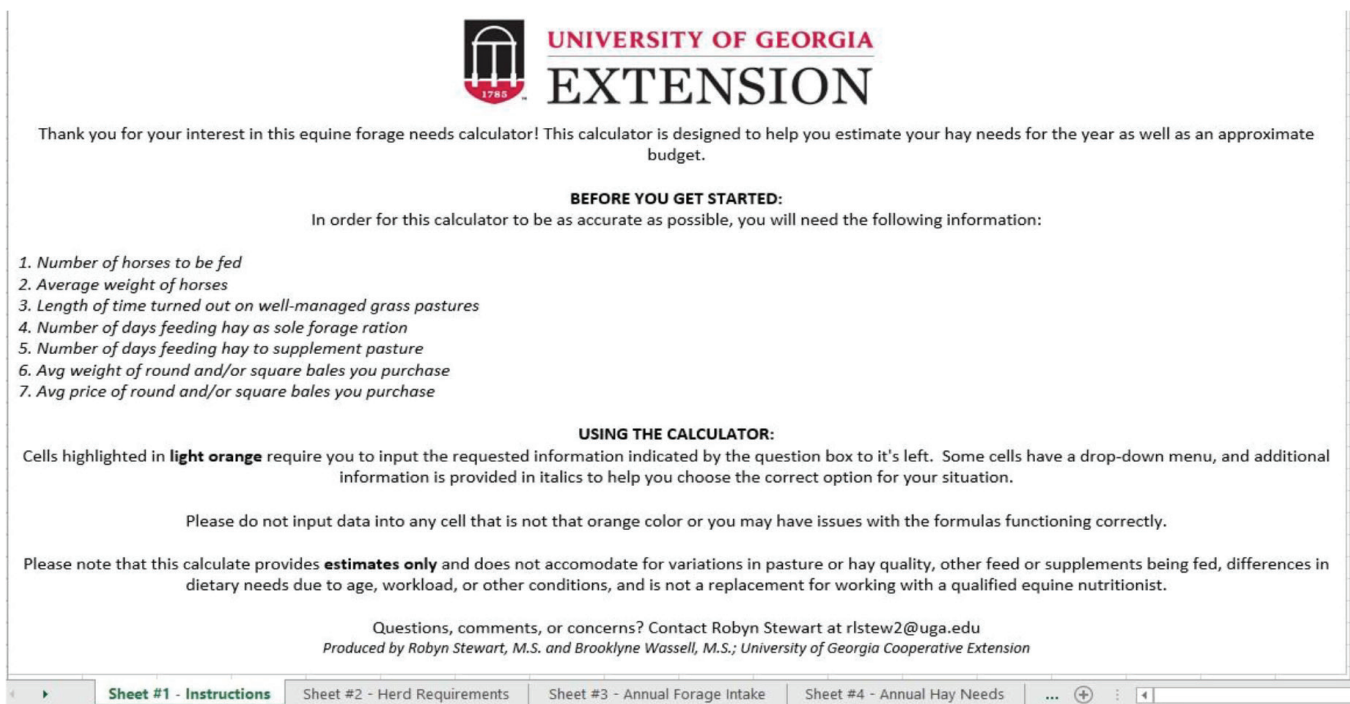
**SHEET 2: HERD REQUIREMENTS**

The second sheet is designed to estimate the individual and total forage intake requirements for a herd of horses. Users need to input each horse’s name and BW in pounds. Horses can be weighed in three ways: on a scale, such as at a vet’s office; via calculation by using measurements of heart girth and body length; or with a weight tape (commonly found at feed stores). The preferred way of determining adult horse weight for use in this calculator is by using the formula  $(Heartgirth)^2 \times Body Length$  (Ivey, n.d.). An additional resource for determining BW can be found in the References portion of this article. It is recommended that horse owners overestimate BW to ensure that the calculations are as accurate as possible to best meet their needs. Inaccurate body-weight measurements will skew the calculations in the rest of the program and can quickly compound inaccuracies in the final values. After entering names and weights, users need to determine how much hay they intend to feed as a percentage of the horse’s BW. Options are based on standard recommendations and include 1.0% BW for weight loss, 2% BW for maintenance, and 2.5% BW for weight gain or forage-only diets (NRC, 2007). The calculator then automatically calculates the daily forage requirement for each individual horse and sums the individual totals to provide a daily requirement for the entire herd (Figure 2).

**SHEET 3: ANNUAL FORAGE INTAKE**

The third sheet of the calculator is designed to evaluate the impact of pasture access on the hay needs of the herd. Pasture intake is estimated by using a grazing rate of 1–2 pounds of dry matter per hour, but actual intake will vary (Siciliano, 2013). Users need to state how much time their horses spend grazing an actively growing, well-managed pasture and how many horses they are feeding. Options include no grass/dry lot/no turnout, less than 8 hours, 8–14 hours, and 14–24 hours (Siciliano, 2013). Based on length of turnout and number of horses being fed, the program determines how much forage the pasture can provide and how much additional forage the horses need to meet their requirements.

This sheet also accounts for how many days hay will be fed as the sole forage source and how many days it will be fed as a supplement to pasture. For example, horses that are continuously stalled or on dry lots are commonly fed hay as their sole source of forage. On the other hand, horses with 24/7 turnout may need only supplemental hay in specific times of year. Users need to input how many days in the year they feed hay as the only forage and how many days they feed hay as a supplement to pasture. This value may change from year to year and is an estimate;



**Figure 1.** Screenshot showing sheet 1: instructions from the Hay Inventory and Purchasing Calculator for Horse Owners.

# Hay Purchasing Calculator for Horse Owners

Sheet #2: Calculating Herd Requirements			
<p>This portion of the calculator will estimate forage intake requirements for each horse in your herd and provide a total volume of forage you need to feed each day. A critical part of this calculation is accurately weighing each of your horses. This can be done in three different ways. The first and most accurate is to weigh your horse on a scale, such as at a vets office. The second most accurate way is to calculate body weight from measurements of the heart girth and body length. The final way is to use a weight tape commonly found at your feed store. Inaccurate body weight measurements will skew the calculations in the rest of the program and can add up quickly! More information on weighing horses can be found here:  <a href="https://extension.tennessee.edu/publications/Documents/SP795.pdf">https://extension.tennessee.edu/publications/Documents/SP795.pdf</a></p>			
Horse's Name	Weight (lbs)	How much hay do you intend to feed each day? <small>*General acceptable standards are: 1.0% BW for weight loss, 2% BW for maintenance, and 2.5% BW for weight gain or forage-only diets .</small>	Hay Needed (As Fed)
Webb	1100	2%	26
Splash	1050	2%	25
Annie	900	2%	21
Boomer	1400	2%	33
		2%	0
<b>Your herd requires an estimated</b>		<b>105</b>	<b>lbs of forage per day</b>

Figure 2. Screenshot showing sheet 2: calculating herd requirements.

Sheet #3: Calculating Annual Forage Intake		
<p>In Part #1, we calculated how much forage your horse can consume each day and estimated the total volume of forage needed for your herd on a daily basis. Now, we need to evaluate the impact of pasture access on your horses hay needs and determine how much of their daily needs can be met by pasture. Pasture intake is estimated using a grazing rate of 1-2lbs of grass (dry matter) per hour. Please note that actual pasture intake will depend on horse size, stocking rate, pasture management practices, and environmental conditions.</p>		
<i>Your herd requires an estimated</i>	105	<i>lbs of forage per day</i>
How much time do your horses spend turned out in an actively growing, well-managed, pasture? (drop down menu)	14-24 hours	
How many horses are you feeding?	4	
<i>Pasture provides an estimated</i>	64	<i>lbs of forage per day</i>
<b>With access to well-managed pasture, your herd needs an additional</b>	<b>41</b>	<b>lbs of hay each day to meet their nutritional requirements.</b>
Calculating Total Annual Hay Intake		
<p>Next, we will calculate how many days of the year you will feed hay as the sole (only) forage source and how many days you will feed hay as a supplement to pasture or grass access.</p>		
How many days will you have to provide hay as your primary source of forage (no pasture or grass available, i.e. winter)?	0	days
How many days will you feed hay as a supplement to pasture or grass access (i.e. spring, fall, times of drought, etc)?	60	days
<b>Based on your estimated feeding rates, you will feed approximately</b>	<b>2442</b>	<b>lbs of hay in this time period.</b>

Figure 3. Screenshot of sheet 3: calculating annual forage intake.

therefore, it is recommended that calculator users overestimate the number of days they plan on feeding hay. The calculator then provides an estimate of the total volume of hay needed for the number of days users expect to feed it (Figure 3).

## SHEET 4: ANNUAL HAY NEEDS

The fourth sheet of the program is designed to take the requirements of the herd and calculate how many round and/or square bales are needed to feed during the time period specified. Users input the average weight of the hay bales they feed in pounds and identify the number of days they feed each hay type, with and without supplemental grazing. For round bales, users also need to estimate their hay losses during the feeding, moving, and storing process. Low losses (5%–10%) include using covered storage, hay rings, and nets. Average losses (10%–20%) are

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incurred without the use of hay rings and nets, and high losses (25% or more) occur without covered storage or protective feeding equipment (Martinson et al., n.d.). Once the necessary information is input, the calculator estimates the number of round and/or square bales the user needs to feed for the time period specified (Figure 4).

### SHEET 5: ESTIMATED EXPENSES

The final sheet of the calculator can be used to estimate the annual expense of hay. Users input their average price for round and/or square bales. Using the number of bales needed from Sheet 4, the program calculates the amount of money spent on each hay type and provides an estimated annual hay expense (Figure 5).

Sheet #4: Calculating Annual Hay Needs		
Now that we have an accurate estimate of your herds total annual hay intake, we can estimate the number of round and/or square bales you will need to purchase. In order to correctly evaluate how many of each type to purchase, you must specify how many days you feed round bales versus square bales.		
<i>Your herd requires an estimated</i>	105	<i>lbs of forage per day</i>
<i>With access to well-managed pasture, your herd needs an additional</i>	41	<i>lbs of hay each day to meet their nutritional requirements.</i>
<i>Based on your estimated feeding rates, you will feed approximately</i>	2442	<i>lbs of hay in this time period.</i>
<b>Round Bale Needs</b>		
What is the average weight of the round bales you feed?	1000	lbs
How many days will you feed round bales <u>without</u> supplemental grazing/forage?	0	days
How many days will you feed round bales <u>with</u> supplemental grazing/forage?	0	days
How much loss do you expect due to storage, weathering, and feeding methods? (drop down menu)	15%	
<small>Low losses (5-10%) would include use of covered storage, hay rings and nets, etc. Average losses (10-20%) are incurred without the use of hay rings and nets, and high losses (25+%) occur without covered storage or protective feeding equipment.</small>		
<b>Based on estimated feeding rate, bale size, and losses, you will need to purchase approximately</b>	<b>0</b>	<b>round bales</b>
<b>Square Bale Needs</b>		
What is the average weight of the square bales you feed?	45	lbs
How many days will you feed square bales <u>without</u> supplemental grazing/forage?	30	days
How many days will you feed square bales <u>with</u> supplemental grazing/forage?	0	days
<b>Based on estimated feeding rate and bale size, you will need to purchase approximately</b>	<b>70</b>	<b>square bales</b>

Figure 4. Screenshot of sheet 4: calculating annual hay needs.

Sheet #5: Calculating Estimated Expenses		
Now that we have an estimate of how much hay you'll need for the next year, we can calculate our annual expense of purchasing that hay. Please note that this calculation does not include added expenses of transportation, labor, storage, etc.		
<i>Your herd requires an estimated</i>	105	<i>lbs of forage per day</i>
<i>With access to well-managed pasture, your herd needs an additional</i>	41	<i>lbs of hay each day to meet their nutritional requirements.</i>
<i>Based on your estimated feeding rates, you will feed approximately</i>	2442	<i>lbs of hay in this time period.</i>
<i>Based on estimated feeding rate, bale size, and losses, you will need to purchase approximately</i>	0	<i>round bales</i>
<i>Based on estimated feeding rate and bale size, you will need to purchase approximately</i>	70	<i>square bales</i>
What is the average price you pay for a round bale?	\$0	
What is the average price you pay for a square bale?	\$6.75	
Based on estimated annual hay needs, you will spend	\$0.00	on round bales.
Based on estimated annual hay needs, you will spend	\$471.18	on square bales.
<b>Your total estimated annual hay expense is</b>	<b>\$471.18</b>	

Figure 5. Screenshot of sheet 5: calculating estimated expenses.

# Hay Purchasing Calculator for Horse Owners

## LIMITATIONS

It is important to recognize that the calculator provides only estimates and does not accommodate variations in pasture, hay quality, feed or supplements being fed, or differences in dietary needs due to age, workload, or other conditions. It is not a replacement for working with a qualified equine nutritionist, but it can provide a starting point for horse owners. The program was designed with the intention of covering a yearlong time period but can be used to cover smaller periods as well.

## CONCLUSION

The Hay Inventory and Purchasing Calculator for Horse Owners is a useful tool for Extension professionals, equine business owners, and horse owners to estimate the volume and cost of hay needed to feed their herd over a period of time. Specifically, they can determine daily intake requirements and contribution of pasture to intake needs, estimate the number of round and/or square bales needed for a specific time period, and determine a hay purchasing budget. This information can be used to prepare for hay feeding season, reduce stress around purchasing hay, better manage equine diets, and allow for better financial planning and recordkeeping.

## REFERENCES

- Ivey, J. L. (n.d.). *Equine welfare series: Evaluating your horse's body weight and condition*. University of Tennessee Institute of Agriculture. <https://utia.tennessee.edu/publications/wp-content/uploads/sites/269/2023/10/SP795.pdf>
- Martinson, K., Lazarus, W., & Hathaway, M. (n.d.). *Feeding horses with a round-bale feeder*. University of Minnesota Extension. <https://extension.umn.edu/horse-nutrition/feeding-horses-round-bale-feeder#sources-764060>
- National Research Council. (2007). *Nutrient requirements of horses* (6th rev. ed.). National Academies Press. <https://webassets.nationalacademies.org/nrh/>
- Siciliano, Paul D. (2013). *Estimation of pasture dry matter intake and its practical application in grazing management for horses*. University of Minnesota, Minnesota Extension Service. <https://hdl.handle.net/11299/204385>