What Value do Nevada’s Horse owners Place on Cool Season Hay Characteristics?

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Introduction

In the fall of 2005, a survey of 325 horse owners in Nevada was conducted. The survey asked horse owners to rate the importance of cool season hay (such as Timothy or Garrison) characteristics in their purchasing decisions. Respondents were also asked to provide the per ton price paid in 2004, as well as the number of tons purchased. With the use of a hedonic pricing model, it was possible to estimate the value of each individual characteristic of cool season hay in terms of dollars per ton. A hedonic pricing model is used to determine the value of individual components of a commodity, such as the value of the digestibility and nutritional content of hay. The model uses pricing data and linear regression to determine the individual values of each commodity characteristic.

The information from this fact sheet may be used by cool season hay producers to evaluate the potential impact on the price of their product resulting from management decisions focused on achieving the quality characteristics described here. Such decisions may include pest control methods, number and type of hay barns/equipment, and using historical weather data to time cuttings, etc.

Horse Owner Types

The horse owners were asked to describe the primary reason they own horses (Figure 1). The majority of the survey respondents, 67%, consider themselves to be primarily companion horse owners, 13% horse breeders, 10% ranchers, 8% boarders and/or trainers, and the remaining 2% said they were racehorse owners.

Figure 1: Response by Horse Owner Type

Visual Inspection

As cool season hays are traditionally rated based on visual characteristics, the survey respondents were asked whether or not they perform a visual inspection of the hay prior to purchase. The majority of the respondents, 76%, said they do perform visual inspection.
Purchasing History

In addition to providing ratings for the various hay characteristics, respondents were asked to provide information related to their annual cool season hay purchases. Table 1 describes respondents’ average annual Timothy hay and mixed grass purchases. Both tables display this information by individual owner type, as well as over all horse owner types.

Table 1: Average Annual Purchases

<table>
<thead>
<tr>
<th>Horse Owner Type</th>
<th>Timothy Hay</th>
<th>Mixed Grasses</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Horse Owner Types</td>
<td>42.65</td>
<td>127.56</td>
</tr>
<tr>
<td>Boarder/Trainer</td>
<td>19.67</td>
<td>71.00</td>
</tr>
<tr>
<td>Breeder</td>
<td>8.32</td>
<td>66.65</td>
</tr>
<tr>
<td>Companion</td>
<td>53.98</td>
<td>161.55</td>
</tr>
<tr>
<td>Rancher</td>
<td>N/A</td>
<td>76.00</td>
</tr>
<tr>
<td>Racehorse</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Over all horse owner types, as well as in each category of horse owner, mixed grasses were purchased in a much greater quantity than Timothy. Companion horse owners purchased mixed grasses on a significantly larger scale than the other owner types, while the other owner types purchased similar amounts of grasses. Timothy purchases varied greatly over owner types, with companion horse owners again exhibiting the largest quantity of Timothy purchases. Not enough data were provided by respondents identifying themselves as ranchers to calculate the average Timothy purchases for the group, nor were there enough data from racehorse owners to definitively compute a purchasing history.

Characteristic Valuation

The horse owners were asked to rate the importance of several hay characteristics that may be observed during a visual inspection, including digestibility, color, leafiness, nutritional value, and the presence of mold and foreign matter. Respondents were also asked to rate the importance of having a relationship with their hay supplier. Having a relationship with the supplier, digestibility, color, leafiness, and nutritional value were all found to have significant positive impacts on price, while the presence of mold and foreign matter were found to have significant negative impacts on hay price. Table 2 shows the impact of each hay characteristic on the average base price of $165.79 per ton. The following paragraphs describe each characteristic and the value implications in more detail.

Table 2: Characteristic Valuation

<table>
<thead>
<tr>
<th>Hay Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relationship</td>
<td>$51.04/ton</td>
</tr>
<tr>
<td>Digestibility</td>
<td>$28.47/ton</td>
</tr>
<tr>
<td>Green Color</td>
<td>$20.72/ton</td>
</tr>
<tr>
<td>Leafiness</td>
<td>$17.99/ton</td>
</tr>
<tr>
<td>Nutritional Value</td>
<td>$13.66/ton</td>
</tr>
<tr>
<td>Mold</td>
<td>-$21.04/ton</td>
</tr>
<tr>
<td>Foreign Matter</td>
<td>-$71.21/ton</td>
</tr>
</tbody>
</table>

Relationship

In a relatively small agricultural community, as exists in Nevada, a supplier's reputation may carry as much weight as the quality of his/her product. Due to this, developing and maintaining a relationship between customer and supplier can be very valuable. The results of this study support this concept, as having a relationship with the hay supplier was found to have the greatest positive per ton value to Nevada's horse owners. The value of this relationship was found to be $51.04/ton, meaning that not accounting for other variables, the average hay price increases by $51.04 per ton. This is a significant amount, and is something to be considered when marketing hay.

Digestibility

Hay digestibility is an extremely important characteristic, as indigestible hay can cause serious health problems for horses. The results of this study show that Nevada's horse owners are paying $28.47/ton more for hay with perceived digestibility. It is important to note that currently visual inspection is the main form of hay analysis being used in Nevada. Visual inspection cannot determine the actual digestibility of hay as chemical or infrared analysis can, though other hay attributes may be used as a proxy for determining digestibility. Hay that is soft and pliable will be viewed as being more digestible than hay that is brittle,
while hay with a high leaf content will be seen as more digestible than hay with a high stem content.

Green Color
As mentioned, visual inspection is the main form of hay analysis in Nevada, and as such, the color of hay often serves as an indication of hay’s overall quality. Hay that is very green may be viewed as being of high nutritional value, and may also be considered fresh. This study found that horse owners in Nevada are paying $20.72/ton more for hay of good green color. The color of hay may be affected by maturity at cutting, storage method, and the amount of time between cutting and sale.

Leafiness
The leafiness of hay may also be viewed as a signal of hay’s quality. Hay that is leafy may be seen as being easy for horses to digest, and may also be considered as having good nutritional content. This study found that Nevada's horse owners are paying $17.99/ton more for hay that is leafy over hay that is not.

Nutritional Value
Although the nutritional aspect of hay was not found to have as high a value as other aspects of hay, this study found that it is worth and additional $13.66/ton to Nevada's horse owners. It is likely that nutritional value is valued less than other hay aspects because, like digestibility, it cannot be determined strictly though visual inspection. Because other characteristics must serve as signals of hay's nutritional content, nutritional content itself was valued slightly less than other aspects. Keep in mind that characteristics such as color, pliability, leafiness, and maturity may be viewed as signals of hay's nutritional value.

Mold
The presence of mold on hay may occur when hay is stored at high temperatures, with moisture, or in other improper storages. Because the ingestion of moldy hay can make horses ill, it was expected that this factor would have a negative effect on price, and this was found to be the case. This study found that Nevada's horse owners will pay $21.04/ton less for hay that has mold present than they would for the same hay without mold. Due to the fact that horses may avoid eating hay that is moldy, horse owners may not purchase hay with even a minimal amount of mold. This is an important factor to consider when cutting and storing hay.

Foreign Matter
Foreign matter in hay, including dust, beetles and other insects, trash, and weeds, can have serious health effects on horses. This study found that Nevada's horse owners value hay with foreign matter $71.21 per ton less than hay without foreign matter. This is an extremely important factor to consider, as hay with foreign matter may have to be sold at a sharp discount. Hay suppliers should perform their own visual inspection prior to sale to ensure that foreign matter is not present. It should also be noted that the sale of hay with foreign matter may have negative impacts on the supplier's reputation. As having a relationship between supplier and customer was given such a high value, selling poor-quality hay may have lasting effects on a supplier's business.

Conclusions
Although it is impossible to separate the characteristics of hay when making a hay purchase, it is possible to quantify the value hay characteristics through hedonist analysis. Interestingly, horse owners in Nevada place a high value on existing relationships with their hay supplier, indicating the need to provide excellent customer service and make buyer
retention a primary goal. It was also found that digestibility is highly valued by horse owners. However, digestibility cannot be determined through visual inspection alone, thus it seems horse owners are using other hay characteristics as a proxy for digestibility. These proxies may include the color and leafiness of hay.

Nutritional value was also found to be important, although the value was less than that given to other hay characteristics. This may indicate that knowing the true digestibility and nutritional content of hay (through chemical analysis) may help hay suppliers to gain a higher price for their product. It was also found that the presence of foreign matter and mold has a strong negative impact on the price of hay. These hay characteristic values should be taken into careful consideration when making decisions regarding cutting, storing, and inspecting hay prior to sale.

More Information
University of Nevada Cooperative Extension has additional publications relating to hay quality, equine nutrition, niche marketing, and more. These publications can be found online at http://www.unce.unr.edu/pubs.html.

USDA's Agricultural Research Service has several articles online about forage quality, chemical analysis, and the application of near infrared reflectance spectroscopy (NIRS). Search ARS publications online at http://www.ars.usda.gov/main.

References


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