Title
Producer and Consumer Survey: Increasing Alfalfa Hay Sales to Horse Owners

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Abstract
Alfalfa is a high-quality forage for livestock, and the sale of alfalfa hay has significant economic impact on the agricultural community. However, horse owners are often reluctant to feed alfalfa or alfalfa-grass hays to their horses. This reluctance may be due to a misunderstanding of the nutritional benefits, or more logistical barriers, such as bale size. To address this, surveys have been developed to explore what prevents more horse owners from feeding alfalfa hay. The survey for horse owners included questions about the impact of nutritional value, package size, and preservatives in hay selection. A separate survey asked hay producers and brokers were about their experiences selling to horse owners. Responses were received from across the US and totaled more than 1000 individuals. Notable results of interest include the following.

1) Over 35% of hay producers surveyed sell more than 75% of their hay to horse owners.
2) Over 85% of horse owners purchase hay.
3) Horse owners identified the reputation of the hay grower as the most important factor when purchasing hay, above cost, bale size, delivery and hay quality.
4) Nearly 30% of horse owners were not sure if they have ever fed hay treated with a preservative, yet 88% of hay producers report having sold preservative treated hay to horse owners.

Introduction
The American Horse Council (AHC, 2017) estimates that there are more than 7 million horses in the U.S., approximately half of which are utilized for recreational purposes, while the other half are utilized for horse competitions (including racing and showing), for work or for breeding.

Horse diets are based predominantly on forage, often a combination of pasture and hay (de Melo Vasco, 2020). In the upper Midwest, approximately 95% of horse owners provide additional forage to their horses when pasture is dormant and 70% of horse owners provide additional forage to their horses even when pasture is available (Mastellar et al., 2018). Pasture access is usually limited for horses maintained in urban and suburban environments, and for horses kept for racing and competition. Hay is the forage of choice for these operations.

There are no data available that define the amount of hay used annually in the U.S. for horses, but it likely exceeds 3 million tons and may be upwards of 10 million tons. Few horse owners produce their own hay, and thus must purchase hay from local producers, hay brokers or feed stores.

A wide variety of hays are used in horse feeding programs. The predominant grass hay often varies with region, with warm season grasses being more prevalent in the south compared to the north (Gibbs and Cohen, 2001; Hoffman et al., 2009; de Melo Vasco et al., 2020). Surveys of feeding practices suggest that many horse owners rely on the use of grass hays or mixed hays rather than alfalfa (Gibbs and Cohen, 2001; Hoffman et al., 2009; de Melo Vasco et al., 2020).

Individual preference among horse owners seems to be a significant factor in selecting grass hay rather than alfalfa hay. Alfalfa hay usually contains less neutral detergent fiber than grass hays and is therefore more easily digested by horses (Crozier et al., 1997). Alfalfa hay will provide more calories per pound than grass hay and less alfalfa is needed to meet energy needs compared to grass hays of a similar maturity. In addition, alfalfa hay is high in calcium in comparison to grass

hay and it provides more digestible protein and more available amino acids (Woodward, et al., 2011). Compared to grass hay, alfalfa may convey advantages to horses in regard to health of the gastrointestinal tract. Because alfalfa provides more calories per pound than grass hays, the amount of concentrate needed to meet energy requirements can be reduced. Because high intakes of grain-based concentrates may increase the risk of gastrointestinal disease in horses including colic (Tinker et al., 1997), feeding alfalfa may reduce the risk of colic. In addition, a decreased risk of equine gastric ulcers and improved gastric health has been associated with feeding alfalfa as compared to grass hay (Nadeau, et al. 2000; Bauerlein et al., 2020).

There are clear benefits to alfalfa hay as a forage source for horses. Nonetheless, horse owners more commonly feed grass hay instead of alfalfa hay. The purpose of this project was to investigate the attitudes of horse owners towards alfalfa hay. Once the sources of discrimination against alfalfa are recognized, appropriate strategies can be formulated to overcome anti-alfalfa opinions.

Materials and Methods

Two Qualtrics surveys were used to gather information on hay buying attitudes, preferences, and practices of horse owners. One survey targeted horse owners while the second survey was directed to individuals who market hay to horse owners, including hay producers and hay brokers.

Survey #1 – Horse Owners

This survey was designed to determine what parameters horse owners use when shopping for hay. Questions included current hay use (amount, type, package size), most influential parameters (price, delivery, analysis, weeds) and experiences with preservatives. A link to the survey was sent to equine organizations across the US to send to their members and to share on various equine Facebook groups.

Survey #2 – Hay Producers and Brokers

This survey was designed to evaluate the experiences of hay producers and brokers when selling to the horse market. Questions focused on type and quality, price, package size and preservative treatment. A link to this survey was sent to state and national forage and hay associations for circulation among their membership.

Printed versions of both surveys can be found at the end of this document in appendix A (Horse Owner Survey) and appendix B (Hay Producers Survey)

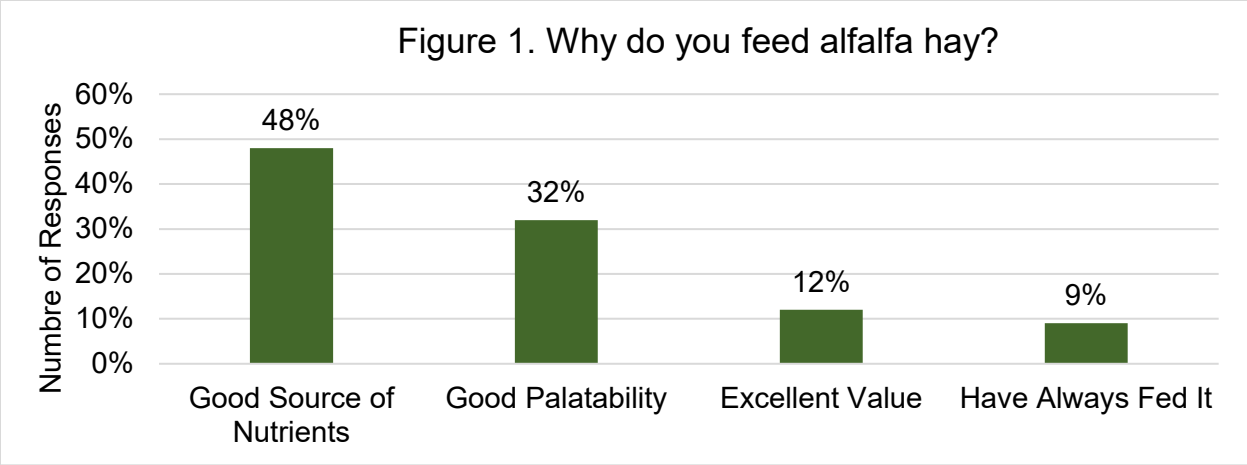
Project Objectives and Results

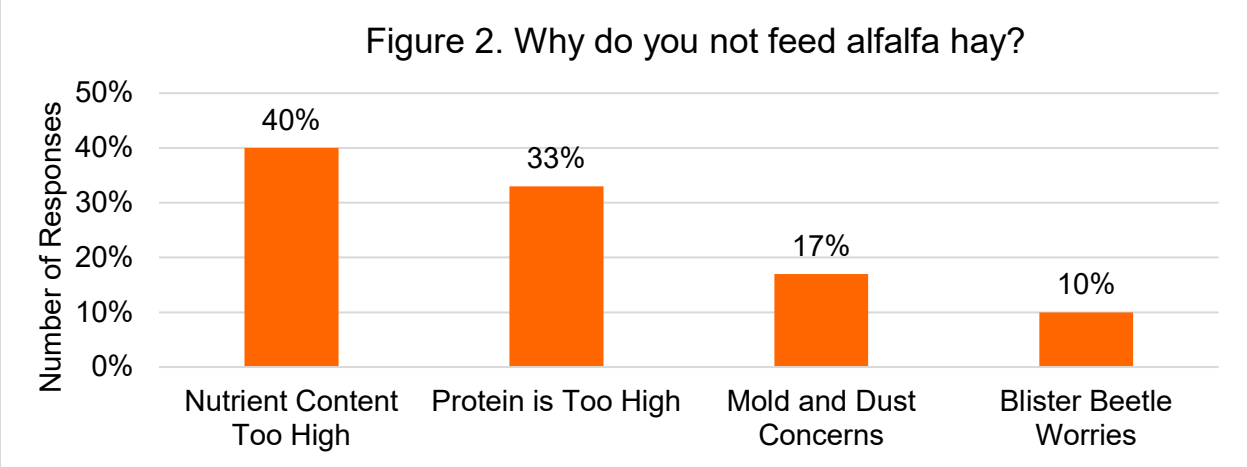
Objectives	Results
To conduct two surveys on horse hay production and use across the U.S.	Over 700 horse owners and 300 hay producers responded to these surveys from 48 and 39 US states and Canadian provinces respectively.
Use the results of the surveys to determine the attitudes/perceptions and production/marketing/distribution practices that limit the use of alfalfa hay for horses.	One of the most impactful data collected from this survey is that horse owners rank hay producers as their number 2 source for information regarding hay feeding and equine nutrition, above their veterinarian, feed store and magazines. Additionally, the reputation of the broker was also ranked as the second-most important factor is selecting where to purchase hay, behind only price.
Develop publications, factsheets, and conference presentations that will increase the use of alfalfa and alfalfa/grass hay by horse owners.	This data was presented and shared in the following places: - Kentucky Alfalfa and Stored Forages Conference, Cave City, 2/21/23 - World Alfalfa Congress, San Diego Ca, 11/16/22 - Hay and Forage Grower Magazine, March 2023.

Results and Discussion

Horse Owner Survey

- More than 85% of horse owners purchase hay for their horse demonstrating there is a large market for horse hay.
- The most important factors given for selecting hay were (ranked most to least important) 1) cost, 2) reputation of dealer, 3) bale size, 4) quality analysis, and 5) availability of delivery
- While nutrition is the reason most horse owners choose to feed alfalfa hay (Figure 1), excess nutrition is also why others choose not to feed alfalfa hay (Figure 2). This aligns with the idea that horses who need a higher plane of nutrition, such as growing horses and lactating mares can benefit from alfalfa or alfalfa mixed hay. Conversely, idle or overweight horses are not good candidates to be fed alfalfa or alfalfa mixed hay.





Hay Producer Survey

- Hay producers still produce more small square bales (48%) than any other size, with roll bales (20%) and large square (13%) bales coming in a distant second and third.
- 60% of responding producers do not sell larger package bales to horse owners, with equipment limitations and personal preference as the leading reasons given.
- 88% of hay producers report that horse owners do purchase treated and preserved hay, while 60% of horse owners report they have never fed treated or preserved hay.

Acknowledgements

Thank you to our supporting organizations that sent out the surveys to their memberships:

American Forage and Grassland Council
Equine Science Review
Midwest Forage Association
National Hay Association
Certified Horsemanship Association
Kentucky Forage and Grassland Council
Kentucky Horse Council
Kentucky Youth Quarter Horse Association

Data analysis was performed by Jen Zimmerman

Funding for this study was provided by the U.S. Alfalfa Farmer Research Initiative of the National Alfalfa & Forage Alliance.

References

American Horse Council. 2017. 2017 Economic impact of the U.S. Horse Industry. American Horse Council, Washington DC.

Bauerlein, V, Sabban, C, Venner, M, et al. 2020. Effects of feeding alfalfa hay in comparison to meadow hay on the gastric mucosa in adult warmbloods. Pferdeheilkunde-Equine Medicine 36:29-35

Crozier, J.A., Allen, V.G., Jack, N.E. et al. 1997. Digestibility, apparent mineral absorption and voluntary intake by horses fed alfalfa, tall fescue and Caucasian bluestem. J. Anim. Sci. 75:1651-1658

de Melo Vasco, A.C, Dubeux, J.C, Wallau, M.O. et al. 2020 Characterization of forage utilization and pasture management practices on Florida horse operations. J. Eq Vet Sci, 95:103253. https://doi.org/10.1016/j.jevs.2020.103253

Gibbs, PG., Cohen, N.D. 2001. Early management of race-bred weanlings and yearlings on farms. J. Equine Vet Sci 21:279-283

Hoffman, C.J., Costa, L.R, Freeman, L.M. 2009 Survey of feeding practices, supplement use and knowledge of equine nutrition among a subpopulation of horse owners in New England. J. Eq Vet Sci. 29:719726.

Mastellar, S.L., Rosenthal, E.J, Carroll, H.K et al. 2018. Assessment of equine feeding practices and knowledge of equine nutrition in the Midwest. J. Eq Vet Sc 62:109-115

Nadeau J., Andrews, F. Matthew, AG. 2000. Evaluation of diet as a cause of gastric ulcers in horses. A, J Vet Res. 61:784-90

Tinker MK, White NA, Lessard P, et al. 1997. Prospective study of equine colic risk factors. Eq Vet J; 29:454-458

Woodward, A.D., Nielsen, B.D. Liesman, J et al. 2011. Protein quality and utilization of timothy, oat-supplemented timothy and alfalfa at differing harvest maturities in exercised Arabian horses. J. Anim. Sci. 89:4081-4092

Keywords

Horses; Alfalfa; Preferences; Preservatives

Default Question Block

What state do you live in?

If your horses do not reside where you do, what state are they in?

How many acres are used with your horses?

How many horses are in your care?

Primary breed of horse you own?

Primary activity with the horses?

Do you grow your own hay?

- ○ No
- ○ Yes

Number of tons per year produced?

Do you buy hay?

- ○ No
- ○ Yes

How many tons or bales per year purchased?

Tons	
Bales	

Typical bale type and weight used with the horses?

- ☐ Small square bales - 40-60 lbs.
- ☐ Small square bales - 61-75 lbs.
- ☐ Three string small square
- ☐ Compressed small square
- ☐ Large square bale - 3X4X8
- ☐ Large square bale - 4X4X8
- ☐ Roll bale - Less than 600 lbs.
- ☐ Roll bale - 600-900 lbs.
- ☐ Roll bale - 950-1200 lbs.
- ☐ Roll bale - over 1200 lbs.

Hay type fed

- ☐ **Alfalfa**
- ☐ **Alfalfa-grass mixed**
- ☐ **Cool season grass** ***(could include timothy, orchard grass, brome grass, fescue, reed canary grass, rye grass, and others)***
- ☐ **Warm season grass** *(could include Bermuda grass, Teff and others)*

If you purchase alfalfa or alfalfa mixed hay what do you like about this kind of hay? Check all that apply.

- ☐ Good source of nutrients for the horses
- ☐ Good palatability
- ☐ Excellent value
- ☐ Have always fed it

If you do not purchase alfalfa or alfalfa mixed hay, what do you not like about this kind of hay? Check all that apply.

- [ ] Nutrient content too high
- [ ] Protein is too high
- [ ] Worry about blister beetles
- [ ] Concerned about mold and dust

When making a buying decision for your hay, which of the following is most important?

Bale size

Delivery available

Cost per bale or ton

Hay analysis available

Reputation of the hay grower

Where do you get your hay buying information?

	Not Important	Somewhat Important	Important	Very Important
Veterinarian	○	○	○	○
Farrier	○	○	○	○
Feed Store	○	○	○	○
Hay supplier	○	○	○	○
University personnel	○	○	○	○
Extension publications	○	○	○	○
Industry professional/trainer	○	○	○	○
Internet	○	○	○	○
In print magazines	○	○	○	○

Have you ever used a hay treated with propionic acid preservative or a bacterial preservative?

- ○ Yes
- ○ No
- ○ Not sure

What kind of preservative was used?

Would you consider using a hay treated with preservative if it meant a higher quality hay free of mold and dust?

- ○ Yes
- ○ No
- ○ Maybe, with more information

Why not?

Other comments

Default Question Block

What state do you farm in?

Do you sell hay?

- Yes
- No

Do you sell hay to horse owners?

- No
- Yes

What percent of the hay you sell goes to horse owners?

- 0-10%
- 11-25%
- 26-50%
- 51-75%
- 76-100%

How many tons annually do you produce of each hay type?

Alfalfa	
Alfalfa-grass mixed	
Cool season grass ***(could include timothy, orchard grass, brome grass, fescue, reed canary grass, rye grass, and others)***	
Warm season grass *(could include Bermuda grass, Teff and others)*	

Do you sell Alfalfa or Alfalfa Grass hay to horse owners?

- ○ Yes
- ○ No

What reasons to horse owners give for feeding alfalfa or mixed hay?

- ☐ Good source of nutrients for the horses
- ☐ Good palatability
- ☐ Excellent value
- ☐ Have always fed it

What reasons do horse owners give for not feeding alfalfa or mixed hay?

- ○ Nutrient content too high
- ○ Protein is too high
- ○ Worry about blister beetles
- ○ Concerned about mold and dust

Typical bale type is produced?

- ☐ Small squares
- ☐ Three string small squares
- ☐ Compressed small squares
- ☐ Large squares
- ☐ Roll bale

What is the average weight of the small square bales?

- ○ 40-60 lbs
- ○ 61-75 lbs

What is the average weight of the three string small square bales?

What is the average weight of the compressed small square bales?

What size are the large square bales?

- ○ 3X4X8
- ○ 4X4X8
- ○ Other

What are the dimensions of the large square bales?

what is the average weight of the large square bales?

What is the average bale weight of the roll bales?

Do you sell any of the large package hay to horse owners?

- ○ No
- ○ Yes

What reasons do the horse owners give for not wanting large packages?

- ☐ No equipment to handle the large bales
- ☐ no place to store large bales
- ☐ Only have a few horses
- ☐ Large bales are hard to feed from
- ☐ Prefer to use small square bales

Do you use a propionic acid preservative when making hay?

- ○ No
- ○ Yes

Do you use a microbial preservative when making hay?

- ○ No
- ○ Yes

What brands?

Do your horse customers buy treated hay?

- ○ No
- ○ Yes

What reason do they give for not purchasing treated hay?

- ○ Uncomfortable feeding treated hay
- ○ Do not understand what the treatment is
- ○ Customers never ask
- ○ Other

Do you use a bale accumulator?

- ○ No
- ○ Yes

Do you repackage large bales into small square bales for the horse market?

- ○ No
- ○ Yes