

Alfalfa Silage Instead of Alfalfa Hay for Dairy Cows: A Profitable Investment?

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Abstract

Alfalfa (*Medicago Sativa*) is a major forage for ruminants worldwide. The objective of this editorial was to underline the advantages of alfalfa silage (AS) over alfalfa hay (AH) as a potentially profitable investment for dairy cows. Alfalfa forage is mainly fed to supply protein, physically effective NDF and minerals and vitamins to dairy cows. Any factor that reduces alfalfa's nutrient supply, will adversely affect its nutritional value for modern dairy cows. The majority of alfalfa's proteins are in leaves. When alfalfa hay is dried, it becomes more exposed to adverse climatic conditions and major leaves losses occur. As a result, alfalfa hay provides only moderate levels of crude protein (e.g. 13 - 15% dry matter-based) to dairy cows. On the other hand, when alfalfa is ensiled, most of its dry matter and proteins are preserved and the resulting forage provides more crude protein (e.g. 20 - 22% DM-based) to the ruminant animal. As a result, dietary needs for expensive protein meals decrease. In addition, high quality AS more palatable and is richer in functional materials than is AH. As such, making silage instead of hay from alfalfa could be a profitable investment in any agriculture-livestock business.

Keywords: *Alfalfa; Hay; Silage; Dairy Cow; Health; Economics*

Philosophy

Alfalfa (*Medicago Sativa*) is a high-yielding, nutrient-rich and highly available forage source for ruminants worldwide. Alfalfa is a perennial flowering plant in the legume family that is highly adaptable crop [1]. Alfalfa is fed as hay (AH) or silage (AS) to dairy cows. Feeding alfalfa haylage is also common in some regions of the world, which is produced when alfalfa is ensiled at higher DM content (40 - 50%). Forage feeding is ultimately a commercial art in dairy production [2]. Alfalfa plant could be an artistic forage for improved dairy production and health around the world. Alfalfa forage is fed mainly to provide physically effective NDF, high quality proteins, and minerals and vitamins to dairy cows. Alfalfa is especially rich in Ca, K, and vitamin A [3]. If alfalfa is harvested at optimal stage of growth and optimal circadian time, it should provide about 20 - 22% crude protein (DM-based). However, when alfalfa is dried and transported and stored as hay, major losses in leaves occur. Leaves contain the majority of alfalfa's proteins. As a result, AH fed in many scenarios contain depressed amount of crude protein (e.g. 13 - 15% if not less). On the other hand, when alfalfa is optimally ensiled, it usually contains enriched amount of crude protein (20 - 22% DM-based). In addition, more DM is preserved by ensilage instead of drying. Moreover, high quality AS is a very palatable forage that stimulates feed intake in sensitive groups such as fresh cows. Furthermore, AS possesses a variety of

known and unknown fresh and functional materials that reduce dietary needs for minerals and vitamins. Because of its more soluble and rumen degradable protein content, feeding AS minimizes potential needs for expensive protein meals and chemical dietary items such as toxic urea. Because of higher energy content, feeding AS instead of AH could reduce dietary needs for cereal grains and fat supplements.

Future research is warranted to uncover optimal inclusion rates of AS for dairy cows at varying physiological states and milk yields. Also, further investigation is required to determine if combined feeding of AH and AS could be more beneficial than feeding either one alone.

Conclusion

Alfalfa plant preserved and fed as silage/haylage instead of hay would potentially offer multiple advantages to any animal agriculture system worldwide. Yielding greater dry matter and crude protein, stimulating feed intake of sensitive groups of dairy cows, and improving milk yield and feed efficiency are among such advantages. Whether feeding certain combinations of AH and AS leads to optimal dairy cow performance and health requires future research.

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