

Urea in Dairy Rations: Action or Addiction?

Akbar Nikkhah*

Chief Highly Distinguished Professor and Scientist, Ferdows Pars Agricultural AND Livestock Holding Co., and Faculty of Veterinary Medicine, University of Tehran and National Elite Foundation, Tehran, Iran

***Corresponding Author:** Akbar Nikkhah, Chief Highly Distinguished Professor and Scientist, Ferdows Pars Agricultural AND Livestock Holding Co., and Faculty of Veterinary Medicine, University of Tehran and National Elite Foundation, Tehran, Iran.

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Abstract

Urea has long been used in dairy rations as a hypothetically reasonable and potential protein source. Urea's advantages over other true protein sources, however, have not been obvious. It seems that urea might be helpful mostly when highly fermentable energy sources and poor protein choices are fed to dairy cows. Principally, feeding more than 100-130 g/d/cow urea is not recommended. Nonetheless, some farmers have been feeding much more than that. Because of urea's possible long-term unfavourable effects on reproductive performance and environmental pollution, feeding urea fuels concerns and remains to be under scrutiny. Because evidence exists that above certain dietary crude protein and rumen ammonia levels, urea would not be advantageous, feeding urea may have not been a concrete action but rather a blind addiction.

Keywords: Urea; Dairy Ration; Protein; Rumen; Environment

Philosophy

Urea has long been used in dairy rations as a debatably reasonable and potential protein source. Urea is converted to ammonia and then can be utilized for microbial protein synthesis in the rumen. Urea contains about 45% nitrogen and protein contains 16% nitrogen. Thus, when urea is converted to protein, the crude protein equivalent value of urea would be about 281%. However, this is only a theoretical calculation, as urea's entire conversion into microbial protein may not occur under many commercial scenarios. This would be the case especially when diets are rich in crude protein (> 13 - 14% of diet dry matter) and rumen degradable protein (> 9 - 10%). Evidence exists that when ammonia levels reach and surpass 5 mg/ml, urea feeding may offer no or very limited benefits [1]. Also, feeding much urea to dairy cows may depress dry matter intake [1]. Feeding more than 100 - 130 g daily urea per cow would not be recommended, as it may depress feed intake and future reproduction. Feeding urea with rumen fermentable molasses may minimize appetite-depressing issues and help make more microbial protein out of the ammonia released. However, this may not occur in reality. At higher feeding frequencies, urea feeding within sensible limits may lead to more efficient nitrogen incorporation into microbial protein [2]. Future studies are required to substantiate such an effect. Research is also warranted to determine whether adding urea to dairy rations above certain dietary crude protein and rumen degradable protein levels would offer any productive and economic advantages. Overall, when major protein sources such as soybean meal, canola meal, corn gluten meal and other choices are very expensive and less available, feeding some urea could be justified. Finally, because of mainly its theoretical benefits, urea feeding to dairy cows seems to have been a commercial addiction and

not a reasonable action. This is because dairy cows usually receive medium- and high-protein diets in which urea might offer no or little benefits. In other words, extra urea would increase environmental pollution.

Conclusion

Urea use in dairy rations seems to have been a commercial addiction and not a reliable and fateful action. Although feeding urea at high dietary crude protein levels (> 13 - 14% of diet DM) may not be very helpful, its use in dairy rations might be justified when commercial protein sources are overly expensive and unavailable.

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