

Effect of dietary vitamin D3 and 25-hydroxyvitamin D3 supplementation on plasma and milk 25-hydroxyvitamin D3 concentration in dairy cows

Article

Accepted Version

Letter to Editor

Guo, J., Jones, A. K., Givens, D. I., Lovegrove, J. A. and Kliem, K. E. (2018) Effect of dietary vitamin D3 and 25-hydroxyvitamin D3 supplementation on plasma and milk 25-hydroxyvitamin D3 concentration in dairy cows. *Journal of Dairy Science*, 101 (4). pp. 3545-3553. ISSN 0022-0302 doi: <https://doi.org/10.3168/jds.2017-13824> Available at <https://centaur.reading.ac.uk/74751/>

It is advisable to refer to the publisher's version if you intend to cite from the work. See [Guidance on citing](#).

To link to this article DOI: <http://dx.doi.org/10.3168/jds.2017-13824>

Publisher: American Dairy Science Association

All outputs in CentAUR are protected by Intellectual Property Rights law, including copyright law. Copyright and IPR is retained by the creators or other copyright holders. Terms and conditions for use of this material are defined in the [End User Agreement](#).

www.reading.ac.uk/centaur

CentAUR

Central Archive at the University of Reading

Reading's research outputs online

Reply to the Letter to the Editor for “A 25-hydroxycholecalciferol-fortified dairy drink is more effective at raising a marker of postprandial vitamin D status than cholecalciferol in men with suboptimal vitamin D status.” (Manuscript doi: 10.3945/jn.117.254789) by Jing Guo, Kim G Jackson, Che Suhaili binti Che Taha, Yue Li, David I Givens, and Julie A Lovegrove

We thank Dr Thomas R Hill and Dr Ilias Kyriazakis for their comments and feedback on our article.

We agreed to derive vitamin D enriched foods by ‘biofortification’ via adding vitamin D supplements to the diet of animal is practice and possible. Our recently review article (1) has summarised previous vitamin D biofortified studies on eggs and milk and found most of vitamin D biofortified studies have higher vitamin D dose than EU diet limit (1, 3). Furthermore, there are few human randomised controlled trial on the effect of those vitamin D enriched foods on the human vitamin D status. In addition, our lab work (4) by adding vitamin D₃ maximum dose within the EU diet limit (2) into dairy cows’ diet and showed negligible increased of vitamin D (vitamin D₃ and 25(OH) D₃) in the milk production. Therefore, vitamin D fortified milk by adding vitamin D supplement directly into milk are needed rather than biofortified milk.

Current finding of ‘dairy drink fortified with 25(OH) D₃ was more effective at raising plasma 25(OH) D₃ concentrations than dairy drink fortified with vitamin D₃ in men with suboptimal vitamin D status’ agreed with previous studies (5, 6), which may indicate the potential application of enriched foods with 25(OH) D₃, although long-term intervention period is needed to confirm the effect of 25(OH) D₃ fortified dairy drinks on human vitamin D status. Furthermore, different vitamin D fortified food are needed to accommodate dietary

diversity (7), thus, future studies are needed to investigate the effect of other foods fortified with 25(OH) D₃ compared with vitamin D₃ on human vitamin D status.

References

1. Guo J, Lovegrove JA, Givens DI. 25(OH) D₃ enriched or fortified foods are more efficient at tackling inadequate vitamin D status than vitamin D₃. *Proc Nutr Soc.* 2017 [Accepted and in press].
2. EFSA FEEDAP Panel (EFSA Panel on Additives and Products or Substances used in Animal Feed) (2012). Scientific Opinion on the safety and efficacy of vitamin D₃ (cholecalciferol) as a feed additive for chickens for fattening, turkeys, other poultry, pigs, piglets (suckling), calves for rearing, calves for fattening, bovines, ovines, equines, fish and other animal species or categories, based on a dossier submitted by DSM. *EFSA J* 10, 2968, 26 pp.
3. Commission Implementing Regulation (EU) No 2017/1492 of 21 August 2017 concerning the authorisation of cholecalciferol as a feed additive for all animal species. *Official Journal of the European Union* L216/19.
4. Guo J, Jones AK, Givens DI, Lovegrove JA, Kliem KE. Effect of dietary vitamin D₃ and 25(OH) D₃ supplementation on plasma and milk 25(OH) D₃ concentration in dairy cows. *J Dairy Sci* [under review].
5. Cashman KD, Seamans KM, Lucey AJ, Stocklin E, Weber P, Kiely M, Hill TR. Relative effectiveness of oral 25-hydroxyvitamin D₃ and vitamin D₃ in raising wintertime serum 25-hydroxyvitamin D in older adults. *Am J Clin Nutr* 2012;95:1350–6.
6. Jetter A, Egli A, Dawson-Hughes B, Staehelin HB, Stoecklin E, Goessl R, Henschkowski J, Bischoff-Ferrari HA. Pharmacokinetics of oral vitamin D-3 and calcifediol. *Bone* 2014;59:14–9.

7. Cashman KD, Kiely M. Tackling inadequate vitamin D intakes within the population: fortification of dairy products with vitamin D may not be enough. *Endocrine* 2016;51:38-46.