Accepted Manuscript

Letter to the editor on 'Enhancing vitamin B_{12} content in soy-yogurt by *Lactobacillus reuteri*, IJFM. 206:56–59'

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PII: S0168-1605(16)30145-3
DOI: doi: 10.1016/j.ijfoodmicro.2016.03.029
Reference: FOOD 7182

To appear in: *International Journal of Food Microbiology*

Received date: 2 February 2016
Accepted date: 28 March 2016

Please cite this article as: Varmanen, Pekka, Deptula, Paulina, Chamlagain, Bhawani, Piironen, Vieno, Letter to the editor on 'Enhancing vitamin B_{12} content in soy-yogurt by *Lactobacillus reuteri*, IJFM. 206:56–59', *International Journal of Food Microbiology* (2016), doi: 10.1016/j.ijfoodmicro.2016.03.029

Dear Editor,

A recent paper in IJFM (Gu et al., 2015) describes that the vitamin B_{12} content of soy-yogurt can be enhanced through fermentation by *Lactobacillus reuteri*. The authors suggest that *L. reuteri* fermented soy product could be served as an alternative food for the aged and vegetarians with a high risk of low vitamin B_{12} content in serum. However, we have concerns about this study.

In humans, diet is considered the most likely source of vitamin B_{12}, but the presence of B_{12} in various foods is misinterpreted due to obscurity in the methodology used to measure the compound and particularly in the ability to discriminate between active forms of B_{12} and other corrinoids (Degnan et al. 2014).While earlier studies reported that *L. reuteri* produces vitamin B_{12} (Taranto et al. 2003; Santos et al. 2008), recent studies using mass spectrometry to accurately differentiate between different cobamides have revealed that *L. reuteri* produces only pseudovitamin form of B_{12} (Santos et al. 2007; Crofts et al. 2013; Degnan et al. 2014). From the perspective of human metabolism, the difference between vitamin and pseudovitamin is crucial, as the transporter protein in the human gastrointestinal tract, the intrinsic factor, has very low affinity to pseudovitamin (Stupperich and Nexø, 1991), making it virtually unavailable to humans.

While the HPLC/UV (Gauch et al., 1992) or UHPLC/UV (Chamlagain et al., 2015) methods can be used for separation of the vitamin-B_{12}-like compounds, Gu et al. (2015) do not document the distinction between the vitamin B_{12} and the pseudovitamin. As production of active B_{12} vitamin by *L. reuteri* would be surprising and contradict current knowledge based on molecular studies (Santos et al. 2007; Crofts et al. 2013) , the distinction between active and pseudo forms is crucial for the assessment of this study.

Furthermore, based on the results obtained with microbiological method (Denter and Bisping, 1994) Gu et al. report production (10%) of vitamin analogs by *L. reuteri*. By definition “analogs” give positive result in bioassay but lack vitamin B_{12} activity and include other corrinoids, such as pseudovitamin B_{12} and factor A, as well as non-corrinoid compounds, such as DNA, deoxyribonucleotides and deoxyribonucleosides (Ball 2006). In the protocol by Denter and Bisping (1994) all the corrinoid compounds, including vitamin B_{12} and pseudovitamin, are destroyed by heating, and the “analogs” supporting growth of the test organism are accordingly non-corrinoid compounds (Ball 2006). Thus, in our opinion the term “vitamin analogs” is used in a misleading context by Gu et al., since here it cannot include pseudovitamin B_{12}.

L. reuteri has a long history of safe use and could be potentially used for in situ fortification of foods with vitamin B_{12}. However, for this purpose it is of vital importance to make a distinction between strains producing the active and the pseudo form of the vitamin.

Yours sincerely,

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