

STATEMENT

30th August 2018

IPA Europe compelled to react to a publication alleging a link between 'brain fogginess' and probiotics use, in view of major issues and limitations of the study.

Scientists and clinical researchers – both academic and from industry – must remain diligent in their assessment and reporting of safety concerns that may arise from probiotics use and in science communication to non-expert audiences. While the study published by Rao and collaborators on Small Intestinal Bacterial Overgrowth (SIBO), proposes a link between 'brain fogginess', D-lactic acidosis, SIBO and probiotic use, several studies have demonstrated the opposite; probiotics can have a positive and beneficial effect on SIBO.

In the general population, D-lactate is naturally converted into L-lactate by endogenous hepatic enzymes or can be metabolised by the gut microbiota. Therefore, consumption of D-lactate producing probiotics poses no safety concern for the general population. D-lactic acidosis is a rare but serious condition, typically occurring in people with short bowel syndrome, where it is related to the consumption of easily fermentable carbohydrates that are not absorbed. While concluding from their observations that probiotics have caused the symptoms, the authors may have simply missed the possibility that the patient population with SIBO were using probiotics to seek relief from their gut symptoms. In similar populations, D-lactic acidosis does not result from consumption of D-lactic acid-producing probiotics. As a matter of fact, *Bifidobacterium*, contained in many of the most popular probiotics, do not produce D-lactic acid. In addition, only a limited number of *Lactobacillus* species actually produce D-lactic acid. Claiming that most probiotics produce D-lactic acid is one of the factual errors in this publication.

Moreover, no evidence is presented to prove the D-lactic acid detected in urinary samples was a result of probiotic consumption. This is important, as numerous intestinal bacteria including *Escherichia coli* also produce D-lactic acid. In cases of SIBO, numerous metabolites are known to be produced in the small intestine, including ethanol, leading to a variety of SIBO symptoms, possibly including the occurrence of symptoms informally defined as “brain fogginess”.

Conclusion: because of the observational nature of the Rao et al. study and its methodological limitations, no conclusive link between probiotic consumption and the

symptoms observed can be made. While the authors acknowledge that they have only established an association between probiotic use and the symptoms, the publication otherwise suggests causation of the symptoms by probiotics, even in the absence of evidence. While this might not be intentional, this is unfortunately misleading and the resulting sensationalist headlines may dissuade safe probiotic use in people who can truly benefit from them.

This may explain why experts in the field reject the conclusions of this study,

The International Scientific Association of Probiotics and Prebiotics (ISAPP) analysed the paper by Rao et al, and came to following conclusion: 'Brain fogginess' and D-Lactic Acidosis: Probiotics are not the cause. A link to the ISAPP article of 21 August 2018 is attached here: <https://isappscience.org/brain-fogginess-probiotics-not-the-cause/>

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ABOUT IPA EUROPE

IPA Europe is the European chapter of IPA, the International Probiotics Association; it was established in Brussels in 2015. The members of IPA Europe are companies directly engaged in the manufacture of probiotic cultures or probiotic foods, supplements, nutritionals or therapeutic products: BioGaia, Chr. Hansen, Danone, DuPont, IPA, Lallemand, Lesaffre, Probi and Yakult. The IPA Europe mission is: to gain acceptance of the term "probiotic" throughout Europe as a defined category and to create a favourable environment for probiotics in Europe. For additional information on IPA Europe's activities see: <http://ipaeurope.org>

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