Review of: "Regular Consumption of Lacto-fermented Vegetables has Greater Effects on the Gut Metabolome Compared with the Microbiome"

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Potential competing interests: No potential competing interests to declare.

This is an observational study on 47 healthy participants subdivided into 23 consumers and 24 non consumers of lacto-fermented vegetables (LFV), whose aim is to investigate the effects of LFV on gut microbiome composition and faecal metabolome.

The analysis of food intake shows higher dietary diversity (Shannon index) in LFV consumers compared to non-consumers, but no significant differences in Healthy eating index has been observed. Also, the fungal and bacterial alpha-diversity did not show any significant difference between the two groups, but consumer group exhibited a relative higher abundance of some bacterial and fungal taxa, some of them commonly found in LFV foods. Finally, the LFV consumers displayed significant difference on faecal metabolome, showing greater abundance of valeric, butyric and acetic acids.

This an interesting and well written study whose greatest limitation is the small number of subjects as stated by the authors. Increasing the number of participants in each group would have increased the strength of the results, allowing to describe the possible differences in dietary component intake and in microbial diversity. On the other side, a randomized controlled intervention study approach applied with such small number of subjects would have been the most accurate way to estimate the effectiveness of a dietary intervention, although it can be very expensive.

Actually, the strength of this study is the faecal metabolomic analysis which allows to highlight the health-related function mediated by microbial metabolism. Although, as stated by the authors, it is difficult to determine the impact of baseline diet on the microbiome and metabolic profile apart from LFV, the authors hypothesized that the SCFA measured in the faeces could be those present in the LFV ingested and not absorbed in the small intestine, even if LFV could have a role in shaping microbiota function towards SCFA synthesis. I wonder if it is possible to make an estimation of the amount of dietary SCFA that the volunteers could have consumed. Moreover, in relation to gut microbioma composition in consumers, it would have been interesting to know the characteristics of the LFV consumed, in terms of ingestion of live or not microbes.

This work can be considered a preliminary study showing promising results on the beneficial effects of LFV consumption.