

# Letter to the Editor: Safety and Reliability of Lactobacillus Supplements

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## Citation

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## Abstract

We are writing in response to the article entitled "Safety and reliability of Lactobacillus supplements in Seattle, Washington (A Pilot Study) in Volume 1, Number 2 of The Internet Journal of Alternative Medicine.

Probiotics are defined as "live microorganisms which, when administered in adequate amounts, confer a health benefit on the host (1)". Two indicators of consumer probiotic product quality are accurate bacterial taxonomy identification and the maintenance of bacterial viability throughout the product's shelf-life. The importance of these issues has rightfully led a number of investigators to study the label claims of commercial products (2, 3). While this type of information is essential to help consumers and health care providers in making meaningful product choices, the lack of uniform validated methods for bacterial recovery has the potential to lead to data misinterpretation and unjustified conclusions, and ultimately hamper progress towards probiotic improvements. As a global supplier of lactic acid bacteria for the food and supplement industries, Rhodia Inc. has extensive experience in working with customers and independent researchers to optimize the recovery of probiotic cultures from consumer products. In our experience, many of the methodologies required for the specific recovery of probiotic bacteria are not generally apparent to our customers and independent testing laboratories. In the vast majority of cases, discrepancies in microbiological viability and identification can be resolved by the use of proper materials or methods.

The recent paper by Berman and Spicer (4) provides a good example of a well-intentioned study which employs insufficient methods that lead to potentially flawed conclusions. In this study, several commercial probiotic products were sampled for microbial content and genetic identification. The stated objectives and aims of the study

appear to be focused solely on isolation of Lactobacillus sp. and contaminant organisms; however 9 out of 20 of the products tested also reportedly contained probiotic Bifidobacterium sp. The authors' conclusion that most of the products sampled did not contain the organisms claimed on the product label is partly based on their inability to recover Bifidobacterium sp. from all but two of these samples. While it is possible that some of the products tested indeed did not contain recoverable bifidobacteria, this high failure rate may in fact be attributed to the insufficiency of the recovery methods. A review of the paper reveals that the authors did not employ selective culturing procedures for the recovery Bifidobacterium sp. from a complex bacterial mixture. The use of selective plating techniques (such as MRS + NNLP (5)) are encouraged for the recovery of Bifidobacterium sp. in mixed cultures where a potentially equal or higher number of competing species are present. Additional methods to ensure the recovery of Bifidobacterium sp. include the use of reducing agents, such as cysteine which is routinely added to the rehydration and recovery medium during enumeration (6), and allowing proper incubation time for outgrowth.

Furthermore, it is essential that we, as scientists, ensure that published research studies contain complete descriptions of methods, as they are essential to both interpret the conclusions and to allow independent repetition of the experiments. In this paper, critical details were not included or adequately referenced including:

- Dilution scheme of the rehydrated sample and plating methods (important to determine at what level each organism could reasonably be detected);
- Incubation times for the original samples (important because longer incubation times are necessary for the recovery of some bifidobacteria)

- Description of the number and type of colonies chosen from each sample and the selection criteria used (important to know whether statistics, colony morphology, or some other method was relied on to ensure that “all viable species were isolated”).

As with any type of microbiological sample, the recovery of bacteria from commercial probiotic products is dependent on the selective culturing conditions employed. In order to add legitimacy to published reports and supply health care providers and the consuming public with the most accurate information facilitating product choices, it is critical that proper methodologies are used and that manuscripts are reviewed by scientists familiar with the procedures. Otherwise, inappropriate conclusions can lead to consumer confusion and does a disservice to reputably manufactured and marketed probiotic products. Therefore, we feel it is imperative that an independent scientific body, such as a working group of the International Scientific Association for Probiotics and Prebiotics (ISAPP, <http://www.isapp.net>), publish recommended enumeration methods based on the latest science.

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## References

1. FAO/WHO. Evaluation of health and nutritional properties of probiotics in food including powder milk with live lactic acid bacteria. 2001. Food and Agriculture Organization of the United Nations and World Health Organization Expert Consultation Report. (<http://www.fao.org/es/ESN/Probio/probio.htm>).
2. Temmerman R., Pot, B., Huys, G., Swings, J. 2003. Identification and antibiotic susceptibility of bacterial isolates from probiotic products. *Int. J Food Microbiol.* 81(1):1-10.
3. Hamilton-Miller JM, Shah S, Winkler JT. 1999. Public health issues arising from microbiological and labelling quality of foods and supplements containing probiotic microorganisms. *Public Health Nutr.* 2(2):223-9.
4. Berman, S., and D. Spicer. 2003. Safety and reliability of Lactobacillus supplements in Seattle, Washington (A Pilot Study). *The Internet Journal of Alternative Medicine.* Volume 1 Number 2.
5. Tharmaraj, N., and N. Shah. 2003. Selective Enumeration of Lactobacillus delbrueckii ssp. bulgaricus, Streptococcus thermophilus, Lactobacillus acidophilus, bifidobacteria, Lactobacillus casei, Lactobacillus rhamnosus, and propionibacteria. *J. Dairy Sci.* 86: 2288-2296.
6. Reid, G., Sanders, M.E., Gaskins, H.R., Gibson, G., Mercenier, A., Rastall, R., Roberfroid, M., Rowland, I., Cherbut, C., and T.R. Klaenhammer. 2003. New scientific paradigms for probiotics and prebiotics. *J. Clin. Gastroenterol.* 37(2): 105-118.

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