Improvement in the viscosity of cow milk and soy milk yoghurt by exopolysaccharides produced from lactic acid bacterial strains

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Abstract: Whey separation is a common problem in yoghurt due to shrinkage of the gel causing an expulsion of liquid. Different types of thickeners, stabilizers and synthetic chemicals are being used to avoid this problem but these are not allowed in some parts of the world. Exopolysaccharides (EPS) produced by lactic acid bacteria are able to improve the rheological properties of fermented milks. The influence on viscosity by five EPS-producing strains in cow's milk and soy milk with and without addition of sucrose was investigated during this study. The viscosities of fermented soy milks ranged from 396.6 ± 40.9 to 810.7 ± 55.5 mPa s, depending on the LAB strain. Soy milk yoghurt fermented with *L. mesenteroides* 112 exhibited the highest viscosity among the cultures obtained in soy milk without sucrose, although the EPS production was the lowest. On the other hand, *W. cibaria* 120 exhibited the lowest viscosity in soy milk without sucrose, although the EPS yield was quite high in these conditions. It appeared that higher EPS production made fermented soy milk more adhesive. In contrast, the viscosity of fermented soy milk supplemented with sucrose increased gradually with the EPS production by the selected LAB strains.

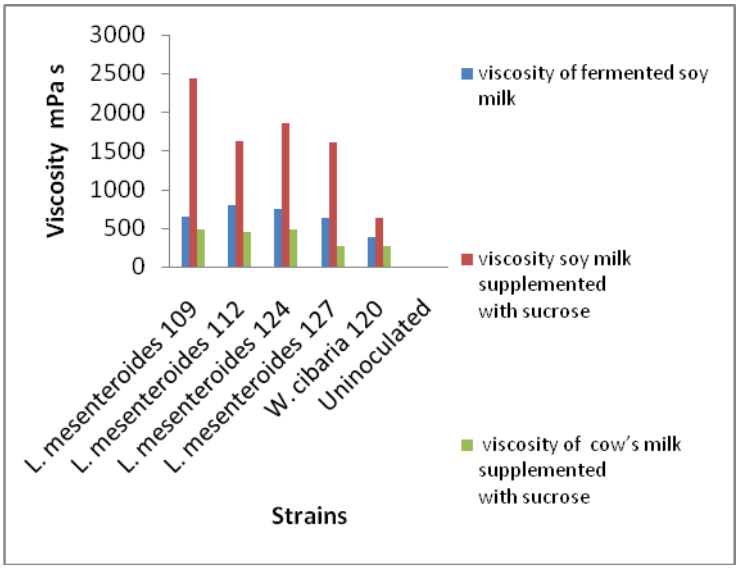

Figure 1: Viscosity of the cultures obtained in soy milk, soy milk and cow supplemented with sucrose.

The highest viscosity (2457.4 ± 43.8 mPa s) obtained in soy milk fermented with *L. mesenteroides* 109 corresponded with the highest EPS production (26.8 ± 1.7 g/l). The values ranged from 272.5 ± 6.5 to 496.5 ± 18.5 mPa s, depending on the LAB strain. The highest viscosities were observed for *L. mesenteroides* 124 and 109, followed by *L. mesenteroides* 112. Whereas in yoghurt made from cow's

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milk fermented with *L. mesenteroides* 127 and *W. cibaria* 120 viscositywas lowest although the EPS production for *L. mesenteroides* 127 was amongst the highest (10.7 ± 0.2 g/l). The contribution of the EPS producing strains to the viscosities of yoghurt appears to be a result of the secretion of extracellular polysaccharides and the ability of the polysaccharides to form strands, which connect these to the casein micelles.

Biography: Dr. Hilal received his B. Sc in Agriculture from Narain College Shikohabad in 2000 and M. Sc. Agriculture (Dairy Science) from R. B. S College Bichpuri, Agra from Agra University (2002). He completed his Ph. D. (2008) in Dairy Technology from N D R I (I C A R), Karnal Haryana. Currently, he is Research Scholar at Department of Food Science and Technology, University of Kashmir Srinagar J&K. His research interests include Dairy Foods, Soy foods, Functional foods, Dairy beverages, rheology and food quality.

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