自製乳酸優酪乳培養時間對菌數含量影響之探討

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摘 要

本研究進行利用市售家庭式DIY優酪乳發酵機進行自製乳酸優酪乳，並探討培養時間對菌數含量影響。採用A、B、C廠牌之市售濃稠優酪乳產品(每毫升含乳酸菌一千萬以上)分別添加於市售含8%以上非脂肪乳固形物之鮮乳製品中進行發酵培養，並於培養及貯存期間分別進行菌數、pH、酸度及衛生測定。實驗結果顯示，自製發酵優酪乳培養至8 hr時，添加A廠牌之發酵乳酸菌總生菌數為7.42 log CFU/mL，添加B廠牌之發酵乳酸菌總生菌數則為8.28 log CFU/mL，添加C廠牌之發酵乳酸菌總生菌數則為8.53 log CFU/mL，均能達到CNS「發酵乳」之乳酸菌總生菌數含量規定。在12 hr發酵後，將自製發酵優酪乳在4℃下進行14天貯存試驗，優酪乳菌數初期仍繼續緩慢生長，添加A廠牌之發酵乳於第4天後之乳酸菌總生菌數即逐漸減少，添加B廠牌之發酵乳則在第8天後，其乳酸菌總生菌數亦逐漸下降，添加C廠牌之發酵乳則在第2天後，其乳酸菌總生菌數即開始下降。發酵乳的pH亦隨著培養時間增加而降低，但其酸度則隨著培養時間增加而升高，在4℃的第10天發酵後，酸度即呈現穩定狀態。衛生安全試驗方面，三者廠牌之發酵乳的大腸桿菌群細菌及大腸桿菌結果皆呈現陰性，此顯示以市售家庭式DIY優酪乳發酵機所自製發酵之優酪乳能符合乳品衛生安全標準。

關鍵詞 : AB乳酸優酪乳 ; 培養(貯存)時間 ; 總生菌數 ; 酸度

目錄

參考文獻

1.丁懷謙。2000。益生菌與腸胃功效。食品工業32 (10) :1-7。 2.王宗燦。2001。乳酸菌與人體健康。Taiwan Food News (183):93-96。 3.伊藤敞敏。1998。乳酸菌代謝產物中多醣成分之生物活性。生物產業9 (2) :112-117。 4.李福臨。1989。食品加工上乳酸菌之利用。食品工業21 (12):32-38。 5.邱雪惠。2004。乳酸菌之抗癌機制。食品工業36 (3) :27-33。 6.陳俊成。2000。發酵乳常用乳酸之生理。食品資訊171 (3) : 52-59。 7.陳勁初。1991。乳酸菌保存食品之機制。食品工業23 (9) : 17-21。 8.陳慶源。2004。益生菌治療法。食品工業36 (3) :45-53。 9.楊媛洵。1998。原生保健性菌種與益生助生質之應用。食品工業月刊 30 (3) :11-21。 10.廖啟成。1998。乳酸菌之分類及應用。食品工業30 (2) :1-10。 11.潘子明。2004。機能性發酵食品乳酸菌製品。生技專題報導(23) :2-13。 12.蔡英傑。1998。乳酸菌與益生菌。生物產業9 (2) :98-104。 13.Ayebo, A. D., Angelo, I. A. and Shahani, K. M. 1980. Effect of ingesting Lactobacillus acidophilus milk upon fecal flora and enzyme activity in humans. Milch Wissenschaft 35: 730-733. 14.Benno,Y., Sawada, K. and Mitsuoka, T. 1984. The intestinal micro- flora of infants: composition of fecal flora in breast-fed and bottle-fed infantos. Microbiol. Immunol 28: 975-986. 15.Braun, O. H. 1981. Effect of consumption of human and other formulas on intestinal bacterial flora in infants. In E.L ebenthal (Ed.), Gastroenterology and nutrition infancy.

p.247-251. Raven Press, New York, USA. 16.Christen, G.. L ., Davidson, P. M., McAllister, J. S. and Roth, L. A. 1992. Coliform and other indicator bacteria.In Standard Methods for Examination of Dairy Products.16th edn. (Ed. R. T. Marshall) p. 247-249. Washington DC, American Public Health Association, USA. 17.Collins, J. K., Thornton, G. and Sullivan. G. O. 1998. Selection of probiotic strains for human application. Int Dairy J. 8: 487-490. 18.Isolaur, E. and Seppo, S. 2004. Probiotics. Best Practics & Research Clinical Gastroenterology 18(2): 299-313. 19.Finegold, S. M., Sutter, V. L., Sugihara, P. T., Elder, H. A., Lehmann, S. M. and Phullips, R. L. 1977. Fecal microbial flora in seventh day Advent- ist populations and control subjects. The American Journal of Clinical Nutrition 30: 1781-1792. 20.Fuller, R. 1989. Probiotics in man and animals. J. Appl Bacteriol 66: 365-378. 21.Kalantzopoulos, G. 1997. Fermented Products with Probiotic Qual- ities. Anaerobe (3): 185-190. 22.Birollo, G. A., Reinheimer, J. A. and Vinderola, C. G. 2001. Enterococci vs non-lactic acid microflora as hygiene indicators for sweetened yoghurt. Food Microbiology 18: 597-604. 23.Goldin, B. R. and Gorbach, S. L. 1984. The effect of milk and lactobacillus feeding on human intestinal bacterial enzyme activity Am. J. Clin. Nutr. 39: 756-761. 24.Hata, Y., Yamamoto, M., Ohni, M., Nakajima, M., Nakamura, Y. and Ta- kano, T., 1996. Placebo-controlled study of the effect of sour milk on blood-pressure in hypertensive subject. Am. J. Clin. Nutr. 64: 767 -771. 25.Hoier, E. 1992. Use of probiotic starter cultures in daity products. Food Australia 44(9): 418-420. 26.Homma, N. 1988. Bifidobacteria as a resistance factor in human beings. Bifidobacteria Microflora 7(1): 35. 27.Hughes, D. B. and Hoover, D. G. 1991. Bifidobacteria: Their pote- ntial for use in American dairy products. Food Technology 45(4): 74-83. 28.Hughes, D. B. and Hoover, D. G. 1991. Bifidobacteria: Their pote- ntial for use in American dairy products. Food Technology 45(4): 74-83. 29.Ishibashi, N. and Shimamura, S.1993. Bifidobacteria: Research and development in Japan. Food Technology 47(6): 126-134. 30.Isolauri, E. 2004. The role of probiotics in paediatrics. Current Paediatrics (14): 104-109. 31.Jay, J. M. 1992. Modern Food Microbiology,4th ed. p. 131-147. Van Nostrand Reinhold, New York, USA. 32.Kalantzopoulos, G. 1997. Fermented Products with Probiotic Qual- ities. Anaerobe (3): 185-190. 33.Lidbeck, A., Geltner-Allinger, U., Orrhage, K. M., Ottava, L., Brismar, B., Gustafsson, J. A., Rafter, J. J. and Nord, C. E. 1991. Impact of Lacto- bacillus acidophilu supplements on the faecal microflora and soluble faecal bile acids in colon cancer patients. Microbial.Ecol. Health Dis.4: 81-88. 34.Lilly, D. M. and Stillwell, R. H. 1965. Probiotic: Growth Promoting Factors Produced by Microorganism. Science 147: 747-748. 35.Saarela, M. L., Lahteenmaki, R., Crittenden, S., Salminen, T. and Mattila, S. 2002. Gut bacteria and health foods—the European perspect- ive. Int. J. of Food Microbiology 78: 99 – 117. 36.Marshall, V. M. 1996. Bioyogurt: How healthy? Dairy Industries International 61(1): 28-29. 37.Midtvedt, T. 1999. In ” Probicties other Nutritional Factors and Intestinal Microflora ” . In Hanson, C. A and Yolken, R. H. (Eds.), Microbial functional activities. p. 79-96. 38.Mitsuoka, T. 1990. Bifidobacteria and their role in human health. J. Ind. Microbiol. 6: 263-268. 39.Mitsuoka, T. 1996. Intestinal flora and human health. Asia Pacific J. Clin Nutr 5: 2-9. 40.Modler, H. W., McKellar, R. C. and Yaguchi, M. 1990. Bifidobacteria and bifidogenic factors. Canadian Institute of Food Science and Technology J. 23: 29-41. 41.Montes, R. G., Bayless T. M., Saavedra, J. M. Perman, J. A. 1995. Effect of milks inoculated with Lactobacillus acidophilus or a yogurt starter culture in lactose-maldigesting children. J. Dairy Sci. 78(8): 1657- 1664. 42.Morra, G. and Boland, C. R. 1995. Heriditary nonpolyposis colorectal cancer: the syndrome, the genes and historical perspectives. J. Netl. Cancer Inst. 87: 1114-1125. 43.Nagendra, P., Shah, W., Lankaputhra, E. V., Margaret, L., Britz, W. and Kyle, S. A. 1995. Survival of Lactobacillus acidophilus and Bifidobacterium bifidum in Commercial Yoghurt During Refrigerated Storage. Int. Dairy J. 5: 515-521. 44.Naidu, A. S., Bidlack, W. R. and Clemens, R. A. 1999. Probiotic spectra of lactic acid bacteria. Food Sci. Nutr. 38: 13-126. 45.Ogawa, N., Satsu, H., Watanabe, H., Fukaya, M., Tsukamoto, Y., Miyamoto, Y. and Shimizu, M. 2000. Acetic acid suppression the increase in disacc- harudase activity that occurs during culture of Caco-2 cells. J. Nutr. 130: 507-513. 46.Ouwehand, A. C. Isolauri, E. and Salminen, S. 2002a. The role of the intestinal microflora for the development of the immune system in early childhood. Eur. J. Nutr. 41(Supp1): 132-137. 47.Parker, R. B. 1974. Probiotics: the Other Half of the Antibiotic Story. Anim. Nutr. Health 29: 4-8. 48.Pool-Zobel, B., Van L. J., Rowland, I. and Rober, F. B. 2002. Experimental evidences on the potential of prebiotic fructans to reduce the risk of colon cencer. Br. J. Nutr. 87(Suppl.2): 273-281. 49.Rautava, S. and Isolauri, E. 2002. The development of gut immune responses and gut microbiota:effect of probiotics in prevention and treatment of allergic disease. Curr. Issues in Intest. Microbiol. 3: 15- 22. 50.Rybka, S. and Kalasapathy, K. 1995. The survival of culture bacteria in fresh and freeze-dried AB yoghurt. The Australian Journal of Dairy Technology 50(2): 51-57. 51.Salminen, S., Ouwehand, A., Benno, Y. and Lee, Y. K. 1999. Probiotics: how should they be defined? Trends in Food Science & Technology 10: 107-110. 52.Sanders, M. E., Walker, D. C., Walker, K. M., Aoyama, K. and Klaenhammer, T. R. 1996. Performance of commercial cultures in fluid milk applic- ations. J. Dairy Sci. 79(6): 943-955. 53.White, C. H. 1998. Testing milk and milk products.In Applied Dairy Microbiology. In Marth, E. H. and Steel, J. L. (Eds.), p. 438-439. New York, Marcel Dekker Inc.