In the search for new preservatives from natural resources to replace or to reduce the use of chemical preservatives 4 strains of lactic acid bacteria (LAB) were selected to be evaluated for their antifungal activity on selected foods. The supernatants of the selected strains delayed the growth of fungi for 23 to 40 d at 4 °C and 5 to 6 d at 20 and 30 °C in tomato puree, 19 to 29 d at 4 °C and 6 to 12 d at 20 and 30 °C in processed cheese, and 27 to 30 d at 4 °C and 12 to 24 d at 20 and 30 °C in commercial bread. The shelf life of bread with added LAB cells or their supernatants were longer than normal bread. This study demonstrates that Lactobacillus fermentum Te007, Pediococcus pentosaceus Te010, Lactobacillus pentosus G004, and L. paracasi D5 either the cells or their supernatants could be used as biopreservative in bakery products and other processed foods. Practical Application: The heat stability nature of the antifungal compounds produced by the LAB isolates offers a promising application of L. fermentum Te007, P. pentosaceus Te010, L. pentosus G004, and L. paracasi D5 as biopreservative in bakery products or other processed foods to replace or reduce the use of chemical preservatives. © 2011 Institute of Food Technologists ®.