The protective effect of a probiotic mixture of 13 different bacteria and α-tocopherol on 98% ethanol-induced gastric mucosal injury was evaluated. Levels of gastric mucosal pro- and anti-inflammatory cytokines, malondialdehyde, and secretory immunoglobulin A were measured. Rats were allocated into four groups: control, ethanol, probiotic, and α-tocopherol. The control and ethanol groups received skim milk for 14 days. Probiotic and α-tocopherol groups were administered probiotic mixture suspended in skim milk and 100 mg/kg α-tocopherol, respectively, by daily gavage for 14 days. On Day 15, gastric lesions were induced by administration of ethanol 98% (1 mL) to all rats except those in the control group. Probiotic, but not α-tocopherol, seemed to inhibit ethanol-induced gastric mucosal tumor necrosis factor-α, interferon-γ, and interleukin-2 production (P > .05). Ethanol caused the elevation of mucosal interleukin-4 level (compared to the control, P < .05). Probiotic pretreatment significantly suppressed the ethanol-induced increase of gastric mucosal interleukin-4 levels. Pretreatment with either probiotic or α-tocopherol inhibited the ethanol-induced increase of mucosal malondialdehyde concentration (P < .01 and P < .05, respectively). Probiotic pretreatment enhanced the gastric mucosal secretory immunoglobulin A concentration (P < .001). In conclusion, probiotic mixture and α-tocopherol reduced ethanol-induced gastric mucosal lipid peroxidation, suggesting that they may be beneficial for gastric lesions induced by lower ethanol concentration.