

**Title** Quality of regular and parboiled rice in long-term storage  
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### **Abstract**

There is interest in storing rice for long periods of time for such uses as disaster relief efforts, military rations and space travel. Rice hermetically sealed in cans and treated to remove oxygen is available in the retail market, but further work is needed to determine the effects of long-term storage on quality. The objective of this research was to investigate the quality of regular and parboiled rice held in residential storage up to 30 years. Sixteen samples of white rice (9 regular, 7 parboiled) packaged in No. 10 cans were obtained from donors. Samples ranged in age from <1 to 30 years. A 52-member consumer panel evaluated prepared rice for appearance, aroma, texture, flavor, and overall acceptability using a 9-point hedonic scale. Acceptance for use in everyday and emergency situations was also determined. Analyses included can headspace oxygen, can seam integrity, color, water activity and headspace hexanal. Aroma, texture, flavor and overall acceptability scores for regular rice did not significantly decrease with age. Appearance, flavor and overall acceptability scores for parboiled rice did decrease with age. The percentage of panelists who would eat regular rice in everyday or emergency situations did not decrease over time. Both types of rice had greater than 80% acceptance for emergency use at 30 years of storage. There was no correlation between headspace hexanal of uncooked rice and hedonic scores of the cooked product. Headspace oxygen ranged from 0.022 to 20.9%. Water activity ranged from 0.32 to 0.69. Results indicate that rice is capable of retaining a high percentage of consumer acceptance over long periods of time and should be included in long-term food storage efforts.