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Effects of long-term storage on quality of retail-packaged pinto beans

C. M. Larson
A. R. Sloan

See next page for additional authors

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Authors
C. M. Larson, A. R. Sloan, Lynn V. Ogden, and Oscar A. Pike

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There is interest in storing low-moisture foods for long periods of time for use in special applications, such as space travel and disaster relief efforts. Pinto beans in retail packaging have been reported to maintain quality and a high percentage of consumer acceptance during storage, but did not retain protein digestibility values ranged from 19.3 to 29.5%, but did not decrease. Samples that had been stored up to 30 years had greater consumer acceptance than samples that had been stored for up to 32 years. Sample numbers of the same age, but with different codes, were stored in the same manner to control for processing techniques and environmental conditions. This study was significant in that it showed that pinto beans could be stored for at least 30 years with minimal loss of quality.

### Results and Discussion

#### Protein Digestibility

In vitro protein digestibility was evaluated using the method of the American Association of Cereal Chemists (1995). The method requires the use of pinto beans stored at 32°C and 0% relative humidity for up to 30 years. The method consists of the following steps: (1) grinding of pinto beans to pass a 0.5-mm sieve; (2) rehydration of pinto beans with water; (3) digestion of pinto beans with pepsin and pancreatin; (4) extraction of proteins with water; and (5) determination of protein content. The method was validated using pinto beans from different sources, including pinto beans stored at 32°C and 0% relative humidity for up to 30 years. The method was found to be accurate and reliable for the determination of protein digestibility in pinto beans.

#### Sensory Evaluation

Sensory evaluation of pinto beans was conducted using a 9-point hedonic scale (1 = extremely dislike, 9 = extremely like) for flavor, texture, and overall acceptability. The sensory attributes that significantly varied with age were flavor, texture, and overall acceptability. The sensory attributes that significantly varied with age were flavor, texture, and overall acceptability.

#### Conclusions

This study was significant in that it showed that pinto beans could be stored for at least 30 years with minimal loss of quality. The results of this study have important implications for the storage and use of pinto beans in special applications, such as space travel and disaster relief efforts. This study also provides valuable information for the development of pinto beans for long-term storage and use. The results of this study have important implications for the storage and use of pinto beans in special applications, such as space travel and disaster relief efforts. This study also provides valuable information for the development of pinto beans for long-term storage and use.