

Quality Changes During Long Term Farmers' Stock Storage

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Since 2012, U.S. annual peanut production has increased 44% from an average of 2.6 million MT compared with 1.8 million MT (1997 and 2012). This production increase has resulted in longer storage times between harvest and shelling. A study was conducted to observe the changes in quality of farmers' stock peanuts when stored longer than one year. Peanuts were harvested and dried according to conventional practice from the 2014 and 2015 crop years. On 04 Nov 2014, approximately 16 MT of dried normal oleic farmers' stock peanuts were divided among four 1/10th-scale warehouses and stored until 05 May 2016. On 30 Oct 2015, approximately 16 MT of dried high oleic farmers' stock peanuts were divided among four 1/10th-scale monolithic concrete domes and stored until 07 Jul 2017. Temperatures were monitored using sensors installed in a grid across the middle of each storage structure. Samples were retrieved from each storage structure periodically to determine the shelling outturns, free fatty acids, and peroxide values. A trained sensory panel determined the flavor profile of the high oleic peanut samples.

The average hourly temperature in the warehouses storing the normal oleic peanuts averaged 17.5 C and ranged between 2 and 31 C. The average warehouse temperature exceeded 13 C 62% of the total time in storage. The loan value of the normal oleic peanuts decreased an average of 6.4% during the 18 mo storage period at an average rate of -0.36% per month. During that same storage period, the peroxide values (PV) increased from 0.34 to 1.0 meq and free fatty acids (FFA) increased from an average of 0.06 to 0.59%. The high oleic peanuts from the 2015 crop were stored 617 days in monolithic concrete domes. The hourly temperature in the domes averaged 21.6 C and ranged from 8 to 31C. The average warehouse temperature was above 13 C 67% of the total time in storage. The relative humidity in the headspace of the domes averaged 71%. The loan value of the high oleic farmers' stock peanuts decreased an average of 4.5% during the 20 mo storage period at an average rate of -0.22% per month. The high oleic peanuts' PV remained essentially the same at 0.63 meq and the FFA increased from 0.31 to 0.84%. Flavor profiles indicate the intensity of the good flavor attributes, primarily Roasted Peanut (RP), remained nearly constant (3.7-4.0 on 1-10 scale) throughout storage. However, some of the off-flavor attributes (Bitter, Astringent, and Ashy) increased to unacceptable levels by the end of the study.