

## RESULTS

### ROASTED SUNFLOWER KERNEL STORED IN LOW OXYGEN

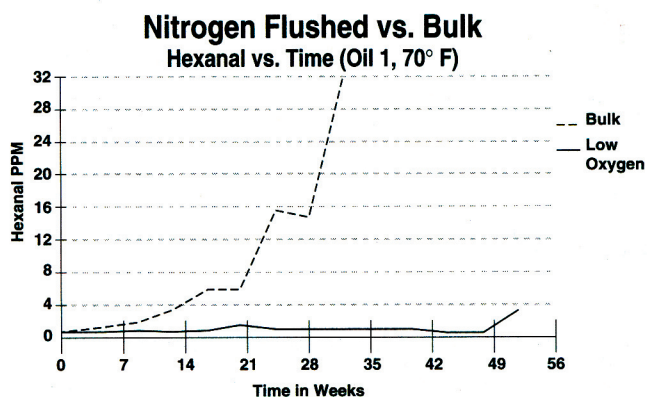
The study found that low oxygen packaging is an effective means of dramatically prolonging the shelf stability of sunflower kernel. Sensory and chemical analysis indicates an acceptable product through 52 weeks, the full duration of the study. Both passive nitrogen flush and vacuum packing were effective. The roasting oils did not impact the results, with sunflower kernel maintaining freshness for both types of oil used.

The hexanal values were well below the threshold of 6 ppm for all samples analyzed. Most were less than 1 ppm. Sensory evaluation scores indicated an acceptable product at the last sensory evaluation at 48 weeks. In fact, freshness scores for the nitrogen flushed package exceeded 60 (33 is the minimum acceptable fresh flavor score) and scored 20 or lower for storage flavor (42 maximum acceptable storage flavor score).

The low oxygen was originally defined in this study as less than 6% oxygen, however passive nitrogen flushing resulted in most packages less than 4% oxygen and many packages contained less than 3% oxygen .

The vacuum packages showed similar results to the nitrogen flushed packages. At 52 weeks the packages with vacuum maintained had hexanal values less than 1 ppm.

FIGURE 1. Low oxygen packaging protects roasted sunflower kernel from oxidative rancidity.



### ROASTED SUNFLOWER KERNEL STORED IN BULK

In order to test the shelf stability of sunflower kernel without protection from oxygen, sunflower kernel was stored in paper packaging at the three different temperatures.

Exposure to ambient oxygen results in a shorter shelf life of roasted sunflower kernel when compared with low oxygen packaged sunflower kernel as illustrated in Figure 1. Roasted sunflower kernel without protection from oxygen at room temperature exceeded the acceptable hexanal threshold at 16 weeks compared to the same product stored in low oxygen packaging which did not exceed the hexanal threshold through the duration of the study (52 weeks).