

STUDY DESIGN

Sunflower kernel is a popular snack and a versatile food ingredient. As with many nuts and seeds, sunflower kernel is susceptible to oxidation after roasting. Exposure to oxygen leads to the development of rancidity and unacceptable flavors. Oxidation rates can be decreased with controlled atmosphere packaging and low temperatures.

To determine the optimum method of storing sunflower kernel, various packaging methods, temperatures and roasting oils were tested in a year-long study conducted by the National Sunflower Association in cooperation with the Minnesota Agriculture Utilization Research Institute and the University of Minnesota. Sunflower kernel was regularly evaluated by chemical and sensory analysis throughout the 52-week study period.

PACKAGING:

PASSIVE NITROGEN FLUSHED (LOW OXYGEN)

VACUUM PACKED (LOW OXYGEN)

BULK PAPER PACKAGE (AMBIENT AIR)

TEMPERATURES:

40° F

70° F

100° F

ROASTING TREATMENTS:

ROASTED IN FRESH PARTIALLY HYDROGENATED SOYBEAN OIL

ROASTED IN FRESH HIGH OLEIC SUNFLOWER OIL

NOT ROASTED (RAW)

METHOD:

1. Hexanal values were used as an indicator of oxidative rancidity and were found to correlate with sensory evaluation. The estimated maximum acceptable hexanal value is 6 parts per million (ppm).
2. Expert sensory evaluation was conducted every 12 weeks by a tasting panel evaluating the sunflower kernel in terms of fresh and storage flavors. The minimum acceptable fresh flavor score was determined to be 33, the maximum acceptable storage flavor score was 42.