

REPORT ON THE RESULTS OF TRIALS USING *PEAKfresh* BAGS TO ASSESS SHELF LIFE

These trials were carried out at the South Australian Research and Development Institute facilities at the University of Adelaide, WAITE Institute Campus, Adelaide. The trials were supervised by Mr. Barry Tugwell, Chief Research Scientist, Post Harvest Horticulture, SARDI, over the period 25 November 1994 to 19 December 1994.

OBJECTIVE

The objective of the trials was to assess the shelf life of iceberg lettuce and broccoli, packaged in various package bags maintained under refrigeration for twenty one (21) days and then subjected to around 20°C for three (3) days simulated shelf display.

MATERIALS

Fresh late season broccoli, approximately 12 hours following harvest was delivered to SARDI at 8:30 am on 25 November in a styrene sealed box with top icing.

Fresh "mustang" variety iceberg lettuce approximately four (4) hours after harvest was also delivered to SARDI in an insulated box.

The core temperature of both vegetables was probe tested and found to be too high for immediate packaging into bags. The temperatures for broccoli were around 5°C and lettuce around 8°C.

TRIALS PROGRAMME

The selected vegetable samples were packed into the trial bags to be used and the bags left open in the storage crates for six (6) hours at around 2°C before selected bags were sealed with twist ties. Probe temperature tests after six (6) hours revealed core temperatures not exceeding 3°C by 5pm on 25 November 1994.

The selected broccoli and lettuce samples were packed into **PEAKfresh** LDPE bags.

PEAKfresh HDPE bags and into standard HDPE bags available in rolls from produce areas in Woolworth's supermarkets.

One sample of each produce line was packed into one sample of each of the three bags and **sealed** with a twist tie.

Similar samples of each produce line were packed into one of each of the sample bags and left unsealed but with the bag top folded underneath the produce.

All four of the crated vegetables were stored under refrigeration in a separate coolroom at a temperature that fluctuated from 0°C up to 2°C at around 40% R.H. The storage period was 21 days. The vegetables were visually inspected at 21 days. The vegetables were in sealed bags and looked to be in similar condition. Produce in the folded unsealed bags appeared reasonable although some colour difference in the broccoli was noticeable. At the end of 21 days storage the coolroom temperature was increased to 20°C at approximately 60% R.H. to simulate the vegetables displayed un-refrigerated in an air conditioned supermarket.

Of the 13 samples in the trial, the six unsealed bags were opened at the top to expose the produce to ambient conditions for three (3) days.

RESULTS

The open bags of broccoli exposed to 20°C for three (3) days destroyed the broccoli. The **PEAKfresh** stored lettuce was limp but capable of being trimmed to reveal a saleable heart. The lettuce in the open supermarket bag was severely dehydrated and by Australian standards was considered un-saleable.

The lettuce and broccoli stored in the sealed LDPE and HDPE **PEAKfresh** bags was in very good saleable condition and following examination, was resealed and taken to a domestic refrigerator and consumed four (4) days later. The lettuce required minor trimming but had maintained moisture and crispness. The broccoli, however, was starting to show minor colour changes but without any noticeable change in taste following blanching in a microwave oven for four minutes.

The lettuce stored in a sealed supermarket bag had developed extensive brown russett damage at the butt and this had started to transfer to the lettuce heart and spine of external leaves. Major trimming revealed some edible lettuce.

The broccoli stored in a sealed supermarket bag had commenced colour change and when opened had a very pungent odour. It was considered non-edible.

This trial has concluded that properly pre-cooled quality produce, such as lettuce and broccoli when packed into sealed **PEAKfresh** bags can withstand a three (3) week storage (comfortable shipping time to north and south Asia) and maintain at least three (3) days un-refrigerated shelf life at retail store level.

Refrigerated storage and display would extend the saleable quality up to at least 10 days.