



Writtle COLLEGE

A partner institution of the University of Essex
Postharvest Unit

SPUDDY BAG EVALUATION TRIAL

Objective

To define and quantify the shelf life provided by three potato storage options – supermarket plastic bag, Lakeland Plastics cotton potato storage bag, Spuddy Bag

Summary

The potatoes in the three treatments were kept for 20 days and there was no disease observed on the Lakeland plastics and the Spuddy Bag treatments, however there was extensive soft rot disease on the tubers kept in the supermarket poly bag (unopened). All three treatments had some sprouting but the Lakeland Plastics had green/purple sprouts that resulted in green flesh in the tuber below the sprout that would raise questions about their flavour and even safety. There were no real differences in firmness or dry matter and the supermarket poly bag sample had lower weight loss.

The Spuddy Bag gave beneficial results over the other two bags evaluated having neither disease or greening issues.

Method and Materials

As per the proposal that is attached as a separate document.

The experiment was continued to 20 days from purchase as opposed to the initially proposed 15 days as facilities were available.

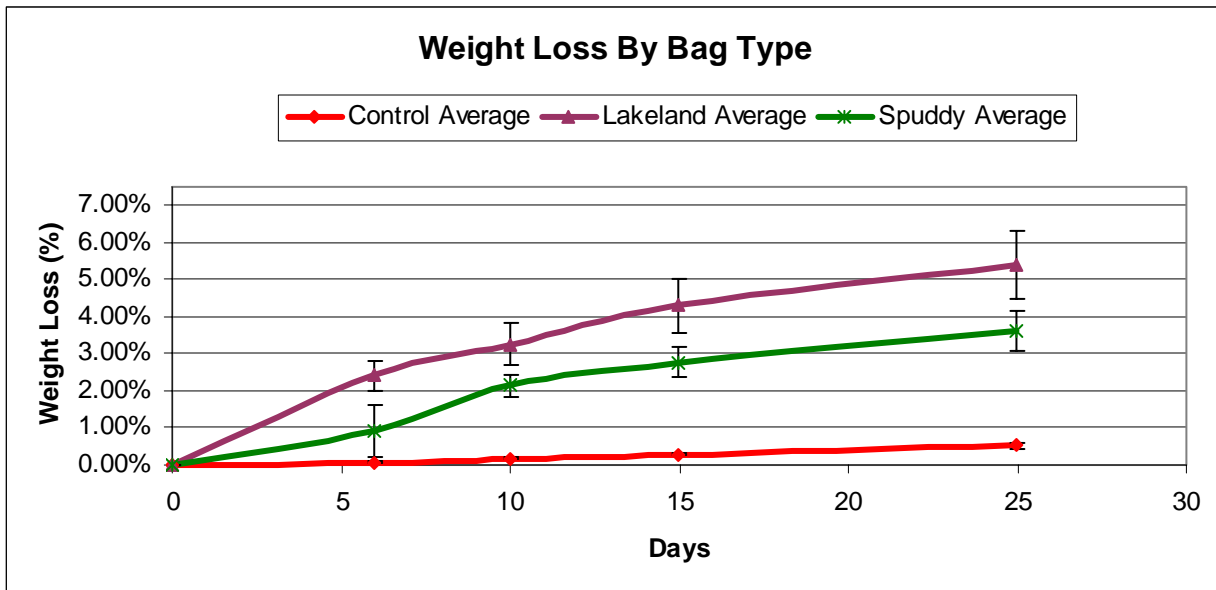
After ten days the light levels were changed to 1000 lux for 12 hours a day to simulate conditions within a kitchen as opposed to a closed larder.



Tubers and Bags at the beginning of the trial. Note the X on some tubers, these will be the tubers assessed for sprouting at the end of the experiment

Weight Loss

The weight loss is summarised in the graph below:



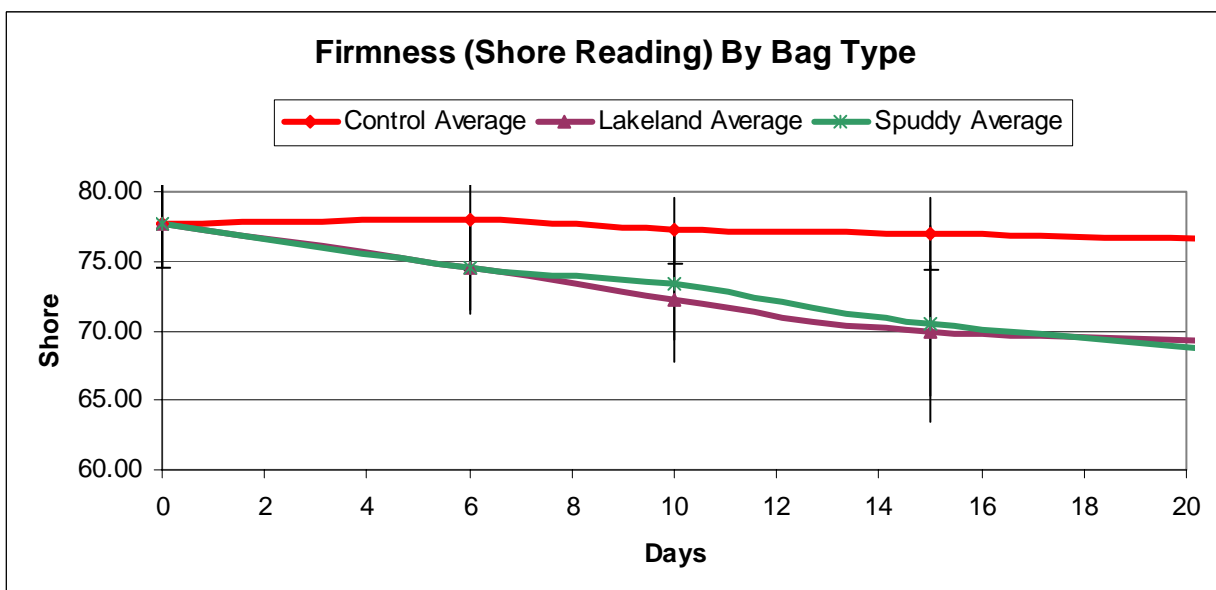
It can be seen that there was very little loss of weight with the supermarket poly bag as this is almost impermeable to water transfer. None of the three treatments gave a big weight loss.

Surface Colour

There was little difference in the surface colour when measured with the Minolta Colour meter with as much variation between potatoes in the same treatment as between treatments. This can be seen in the photographs below. The Minolta colour data is available on request.

Firmness

The firmness figures given below show that the control potatoes kept their turgor but that there was no difference between the other two treatments.



Dry Matter

The results of dry matter tests gave no real difference

	Control	Lakeland	Spuddy Bag
Initial	25.0%	25.0%	25.0%
Final	24.1%	24.4%	24.2%

Photographs and Observations

Disease

A photograph from the end of the trial summarises the state of the control sample.



The level of disease observed on the potatoes made them unacceptable for consumption. There was no greening. The disease is soft rot (*erwinia carotovora*) with a pungent smell.

Sprouting

The lengths of the sprouts on the tubers which had been marked at the beginning of the experiment were measured on August 1st and the results summarised in the table below.

	Mean length of sprouts	Range and (standard deviation)	Comments
Control	7.9 mm	5-14 mm (3.38)	Very weak, many dropped off as the tubers were moved
Lakeland Plastic	3.2 mm	2-5 mm (1.20)	Short, multiheaded, green/purple in colour
Spuddy Bag	3.9 mm	1-5 mm (1.59)	White, weak but had to be positively removed.



Lakeland Plastics

Control

Spuddy Bag

From the comparison photograph taken on August 1st it can be seen that the sprouts are very different on the three treatments with green/purple multi headed sprouts on the Lakeland Plastic and a few weak sprouts on the control and the Spuddy bag . These weak white sprouts could be easily knocked off. The green/purple sprouts are result of the tubers being exposed to light. As

stated in the initial proposal the light level was low (less than 100 lux) which would suggest that the Lakeland Plastics bag provides little protection against the light. The supermarket poly bag has a compound in the plastic to reduce UV light which is why the apparently transparent bags did not result in green tubers.

However the big difference was just below the surface as when the control or Spuddy Bag tubers were cut close to the sprouts there was no internal change however with the Lakeland plastics there was distinctive greening. (the greening is glycoalkaloids which would give the tubers a bitter taste and is poisonous in large quantities). The greening occurs when the potato tubers are exposed to light. The level of lighting was low (below 100 lux) during the trial which suggests that the cotton bag of Lakeland plastics provides very little protection from UV light.



Spuddy Bag

Lakeland plastics

Control

Comment

The Spuddy Bag gave beneficial results over the other two trialed bags. The disease levels would make preparing and using the tubers that had been kept in a closed poly bag unappealing. The slight greening on the tubers with the Lakeland Plastics bag could be a cause for concern. The Spuddy Bag gave satisfactory results without the concerns expressed for the other two storage bags.

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