

Shrink wrap – still necessary - Further investigation by the CGA September 2018

The increasing need to reduce the plastic contamination of the only world we have to live in - has prompted a BBC program to look into the "need" to use plastic to wrap a number of products – including cucumber. The CGA has long argued for the retention of shrink wrapping to preserve the quality of cucumber so that customers can enjoy the product at its best. A study was carried out in 2007 to demonstrate this. To make the point the work was repeated in 2018 in preparation for the BBC program.

Fruit was taken from a single site on 28th August – fruit was in the weight range 300 - 400 gram.

Thirty-eight fruits were taken from the site - half naked and half shrink wrapped. Each sample was then split into two sub samples and half was placed in plastic crates and kept at 7 - 9 C in a commercial cold store the other half was kept in plastic crates in a commercial (un-refrigerated) store.

The fruit was measured every other day for 11 days to measure weight losses and also the amount of bend. The amount of bend was assessed by a simple measure of deflection of the flower end of the cucumber from half way down the fruit to the tip. A fresh cucumber [still attached to the plant] will deflect up to 1.0 cm by this measure.

The major concern in not wrapping the fruit is the extreme quality reduction from weight loss. Once the fruit starts to shrivel and bend it is no longer "fit to sell" and would be discarded. As cucumber fruit tend to be ribbed [even if only slightly] the ribs tend to dry out first and this gives a very obvious visual effect. These losses still continue once the customer takes the fruit home and reduced quality can mean no further purchases!

One important factor is the look and feel of the fruit - the naked cucumbers were very soft by day three and the skin was quite shrivelled by day five.

By the end of the period of measurement - 11 days - the unwrapped fruit was turning pale but the wrapped fruit was still just about saleable but was slightly soft. None of the naked fruit was saleable after day five and would not have been picked up by Mrs (or Mr) Public after day three (if then!).

Storage in a commercial cold store compared to a (quite warm) ambient environment over this period had little effect on weight loss - if the fruit was wrapped. Weight losses from naked fruit in cold store were virtually the same as in the ambient environment. (full details available)

WEIGHT LOSSES

Weight losses in ambient storage were as follows: -

NAKED FRUIT

Starting weight		2 days	percentage	11 days	percentage
Sample D1	336g	17g	5.06%	73g	21.7%
Sample D3	336g	18g	5.36%	81g	24.1%
Sample D6	347g	20g	5.76%	80g	23.1%
Sample D9	345g	16g	4.64%	85g	24.6%

WRAPPED FRUIT

Starting weight		2 days	percentage	11 days	percentage
Sample B1	349g	1g	0.2%	7g	2%
Sample B3	348g	2g	0.6%	6g	1.7%
Sample B6	357g	7g	1.9%	13g	3.6%
Sample B8	331g	2g	0.6%	7g	2.1%

Naked fruit was looking very poor because of moisture losses by the end of the period.

FRUIT FIRMNESS

Fruit firmness - as mentioned earlier, the amount of bend on a normal fruit [before it is removed from the plant] is up to 1cm movement when measured from half way down its length to the flower end.

The amount of bend was as follows: -

NAKED FRUIT

Amount of bend [cm]		0 days	2 days	6 days
Sample D1	336g	1.0cm	2.0cm	3.5cm
Sample D3	336g	1.0cm	2.0cm	4.0cm
Sample D6	347g	1.0cm	2.3cm	3.5cm
Sample D9	345g	1.0cm	2.3cm	4.0cm

WRAPPED FRUIT

Amount of bend [cm]		0 days	2 days	6 days
Sample B1	349g	1.0cm	1.3cm	1.2cm
Sample B3	348g	1.0cm	1.0cm	1.0cm
Sample B6	357g	1.0cm	1.3cm	1.3cm
Sample B8	331g	1.0cm	1.0cm	1.3cm

It did not get better!

This is a long way round to report that cucumbers need to be shrink wrapped to maintain their weight and quality. Where fruit was stored naked there were weight losses of between 20 and 25% resulting in considerable and rapid reduction in quality. Weight losses of almost 6% were seen from naked fruits in the first 2 days and this increased the amount of bend and reduced the quality of the fruit.

The weight loss of naked fruit was NOT reduced by cold storage.

Where fruit was shrink wrapped, the weight losses were considerably lower - between 1.7 – 3.6% - even after 11 days of storage. Fruit colour was still quite good at the end of the 11 days and the fruit was still firm and of reasonable quality [but not really saleable].

This comparison was carried out in quite extreme ambient conditions along side the cold storage for an extreme period of 11 days - to re clarify the situation - and it does indicate the speed of deterioration of fruit when it is not protected from dehydration.

CONCLUSIONS

The use of shrink wrap has a major advantage in that it reduces moisture losses from the fruit. It also protects the fruit from some damage by scuffing etc in transport. In this trial there were no losses from disease infection on any of the fruit tested but the naked fruit was not fit to eat after 2 – 3 days whereas the wrapped fruit was still edible at the end of the trial.

Use of shrink wrap - at the present time this plastic material is not accepted by municipal waste collection for re-cycling. What is required is a product that is either recyclable or bio-digestible that is recognised as such.