Influence of packaging material on the shelf-life of hydroponically produced Chinese chard

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AIM

This study aimed to explore the influence of different packaging material on the shelf life of hydroponically produced Chinese chard by monitoring the moisture content over a period of two weeks

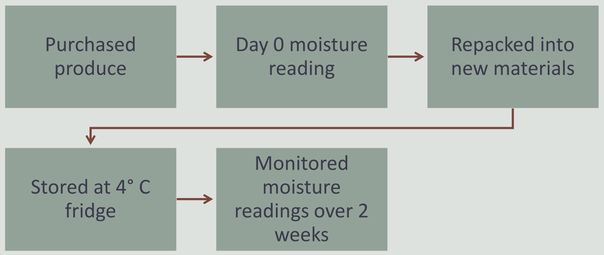
INTRODUCTION

Figure 1. Hydroponics farm (Soh, 2014)

- Hydroponics refers to plants growing in soilless controlled environments (Stauffer,2006)
- Limited research is available on ideal packaging
- Ideal packaging should maintain appropriate moisture content and protect the produce from physical damage

METHOD

- Hydroponic Chinese chard (HCC) were purchased
- Chosen packaging materials : **Control** (original plastic packaging) , **Plastic A** (Cling wrap and Ziploc bags with vents), **Muslin cloth** and **Paper towels**
- Moisture analysis was done biweekly using Mettler Toledo HB43 Moisture Analyzer
- Leaf sample used per analysis was standardised at 3g



RESULTS

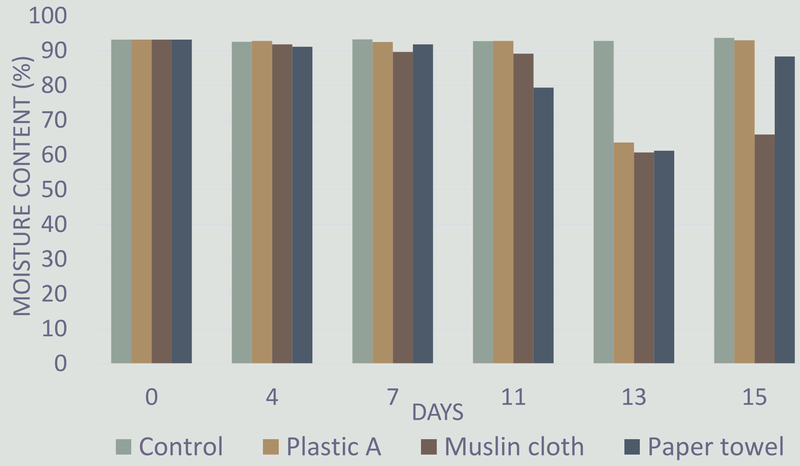


Figure 2. Moisture content of HCC over 15 days

Control

Figure 3. HCC sample 1 at day 0

Plastic A*

Figure 4. HCC sample 2 at day 0

Muslin cloth

Figure 5. HCC sample 3 at day 0

Paper towel

Figure 6. HCC sample 4 at day 0

Day 0

Day 15

Figure 7. HCC sample 1 kept in **Control** packaging at day 15

Figure 8. HCC sample 2 kept in **Plastic A*** at day 15

Figure 9. HCC sample 3 kept in **Muslin cloth** at day 15

Figure 10. HCC sample 4 kept in **Paper towel** at day 15

* Picture taken of samples kept in Ziploc bag with vents

RESULTS

No significant difference (P>0.05) in moisture levels obtained between the **Control** and **Plastic A** samples

Significant difference (P<0.05) observed in moisture levels obtained between **Control** and **Muslin cloth** samples and **Control** and **Paper towel** samples

DISCUSSION

- Sample damage caused the sudden drop in moisture content of plastic A and paper towel samples in day 13
- Packaging material does affect moisture content and in turn the shelf life of the produce
- Plastic A based packaging have been found to be the best at retaining moisture level and desirable physical appearance
- Permeability characteristics of plastic allows favourable transmission rates of oxygen and carbon dioxide (Barmore and Schirmer, 1992)

Limitation

Leaf samples were wilted completely within 15 days

Future recommendation

Observe leaf samples for a longer period of time

Test plastics with differing permeability levels

REFERENCES

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