



Ocean Transportation with CA for Shelf Life Extension

MTI contributes to the increased exports of fruits and vegetables by sea utilizing CA (controlled atmosphere) containers that control temperature, humidity, and oxygen levels inside.

These containers are getting more attention from exporters of agricultural products because they can keep the conditions of fruits and vegetables as good as air transport yet cost around 10% of air transport.

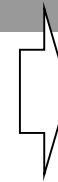
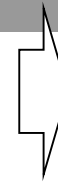
Having originally been involved in the research and development of low-temperature transportation, we have the firm technical background to conduct consulting and provide knowledge about CA transportation.

Monohakobi Technology Institute



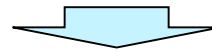
1. Physiology of fruits and vegetables

O₂



CO₂

Respiration is the process by which fruits or vegetables take in oxygen and give out carbon dioxide as same as human beings.



The quality of the fresh fruits and vegetables is deteriorated because sugar content of the agricultural produce itself is consumed as energy for the respiration process.



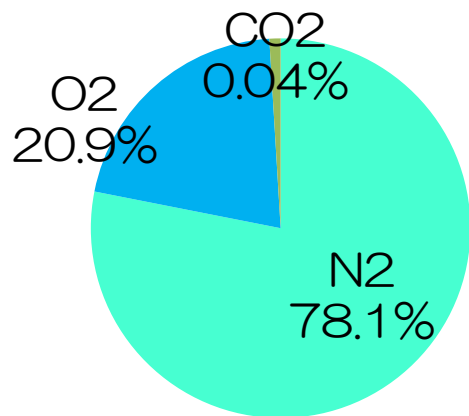
Cooling storage can reduce the deterioration which caused by the respiration.



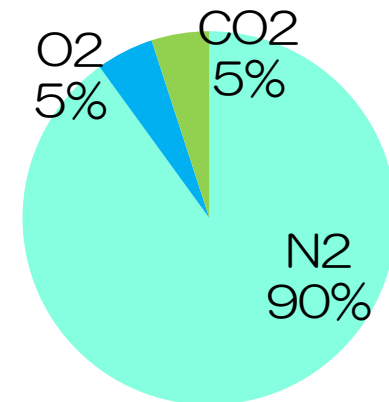
In addition to cooling storage, 'CA' storage can reduce the deterioration because the respiration process is reduced by 'CA' environment.

2. What Is CA (Controlled Atmosphere) ?

It means to adjust air composition of O₂ and CO₂ to suitable air composition for long term storage of fresh fruits and vegetables.



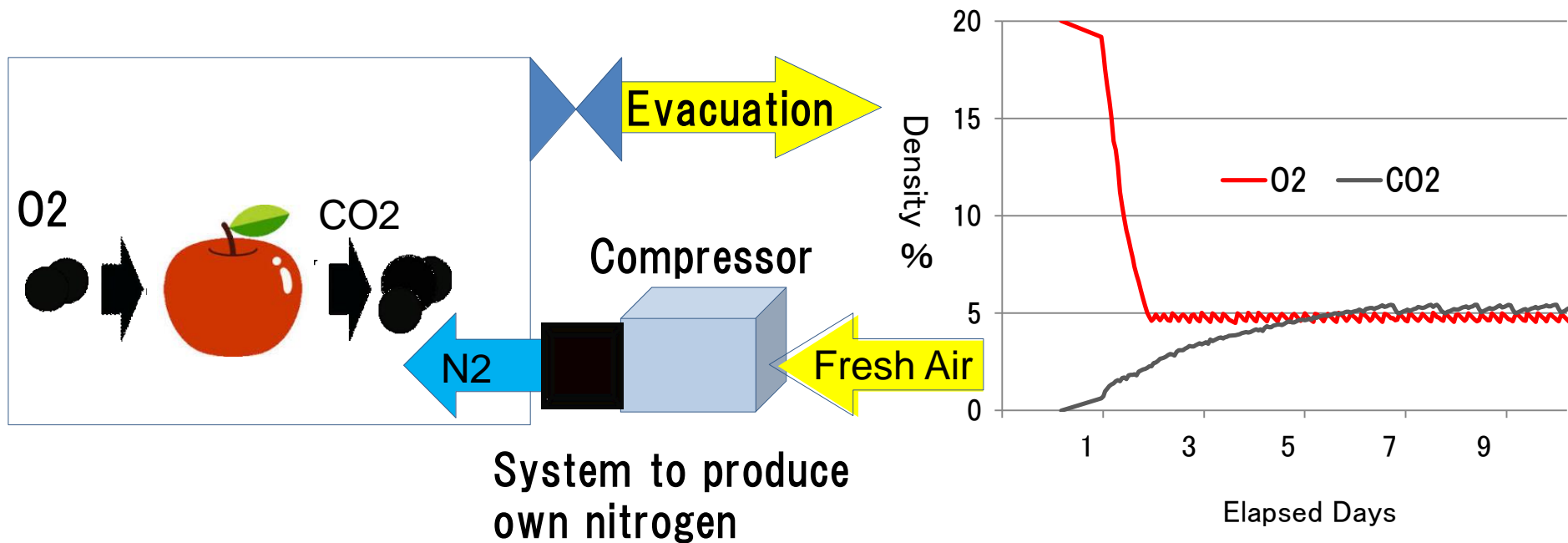
Atmosphere



CA

3. What Is CA Container?

One of reefer containers which have integrated system to produce own nitrogen and other related system to control O₂ and CO₂ inside of the containers in addition to functions of the normal reefer containers.



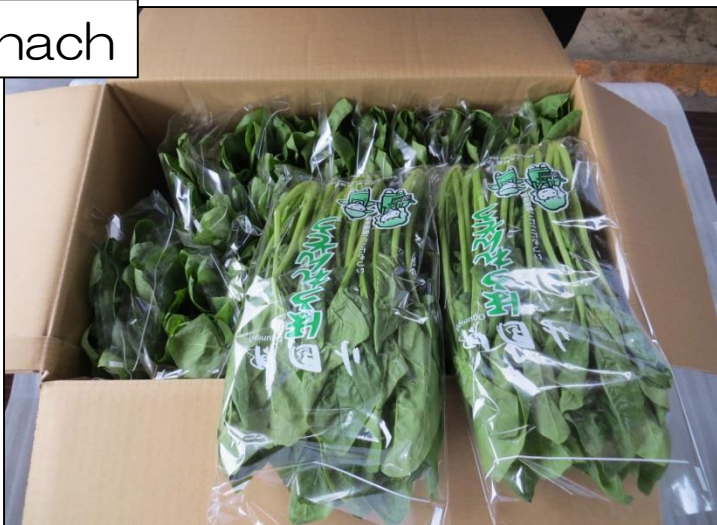
4. Storage Test In CA Container

Example-1

Start

After 2 weeks

Spinach



Komatsuna



Example-2

Start

Shungiku



After 2 weeks



Leaf Lettuce



Example-3

Start

After 2 weeks

Lettuce



Hakusai



Example-4

Start

Asparagus



After 2 weeks



Tomato



Example-5

Start

Grape Tomato



After 2 weeks



Pione



Example-6

Start

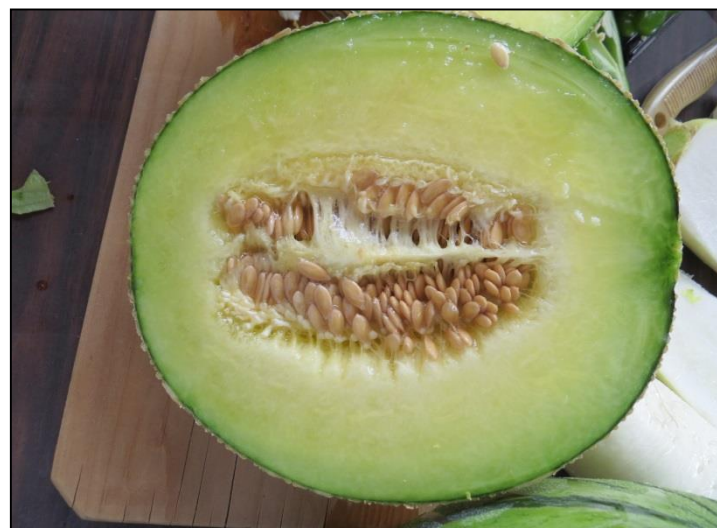
Peach



After 2 weeks



Earls Melon



《Investment of 20feet CA Containers》

- In Japan market, it is first time to provide new 20feet CA Containers.

《Keeping High Humidity Method》 (Patent Pending)

- Keeping High Humidity Method was invented by NYK Line and Monohakobi Technology Institute. The method can keep high humidity environment inside of CA container.