

# Freshmama<sup>®</sup>

Preservative product keeps fruits and vegetables fresh longer  
**FRESH PRESERVATIVE PAD**

International patent under process  
WO 2017/135433A1

**Reducing  
30 %  
Food Losses to  
Zero!**



## Freshmama<sup>®</sup>

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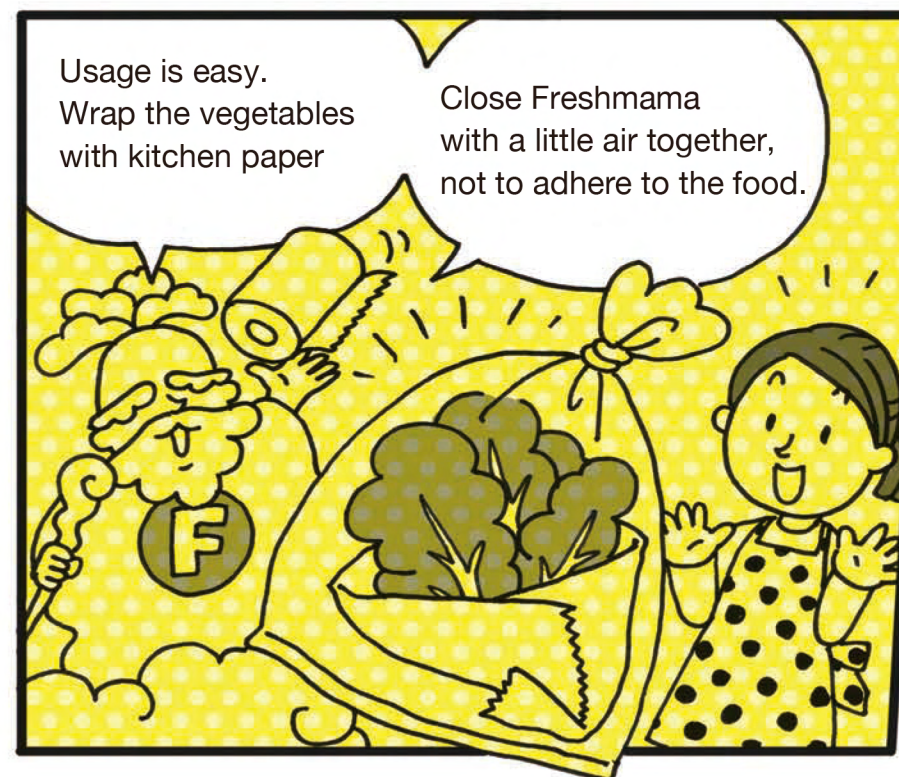
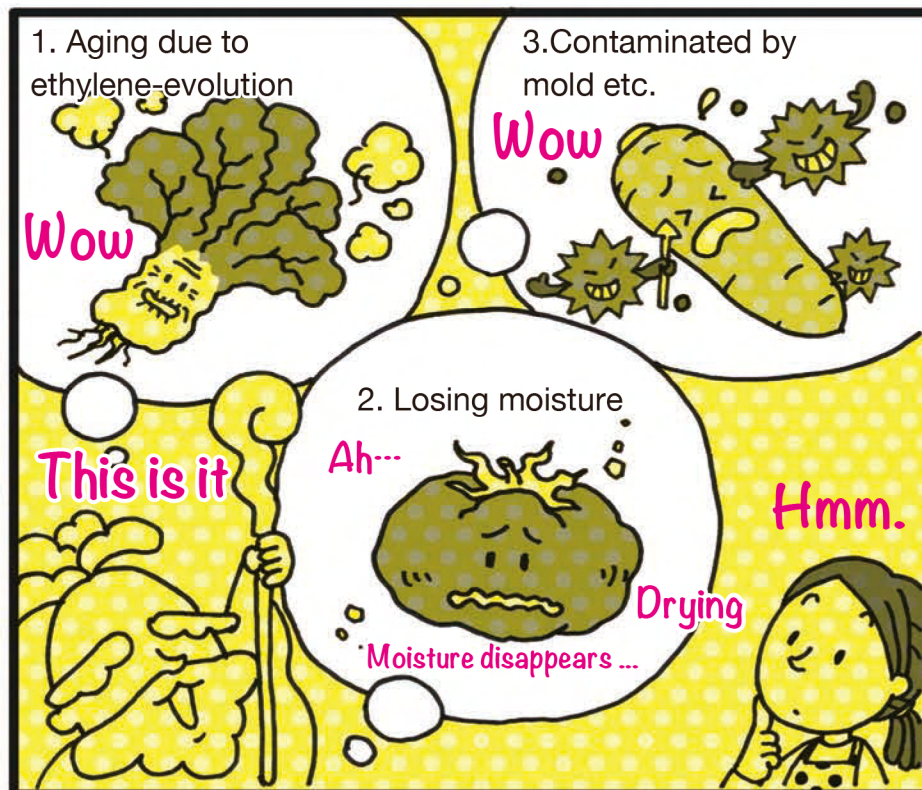
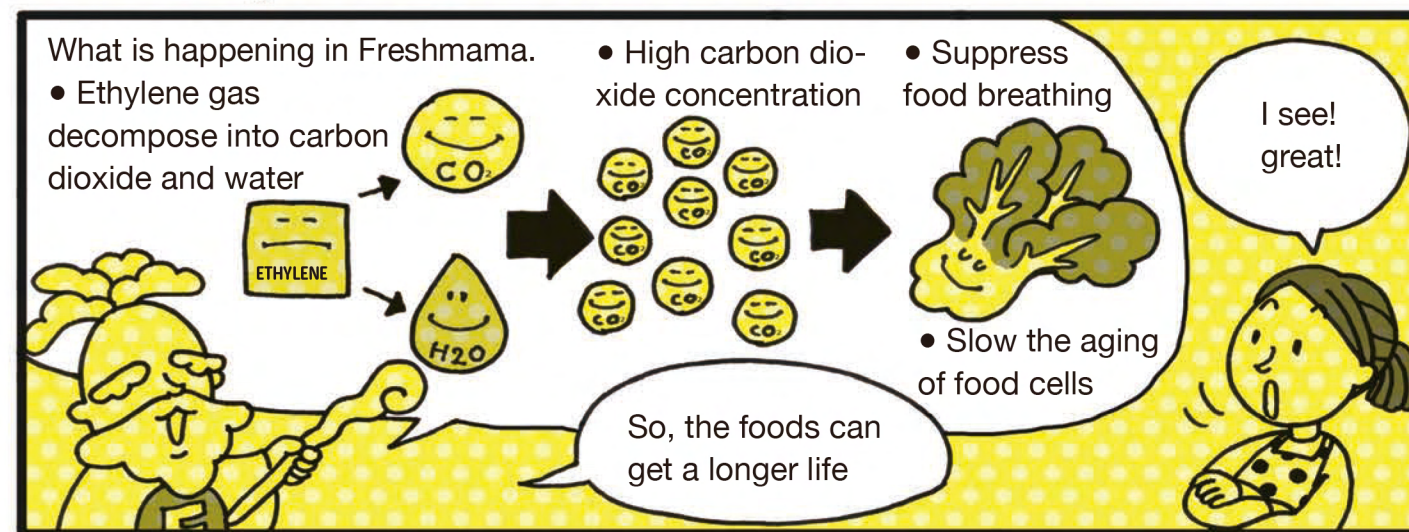
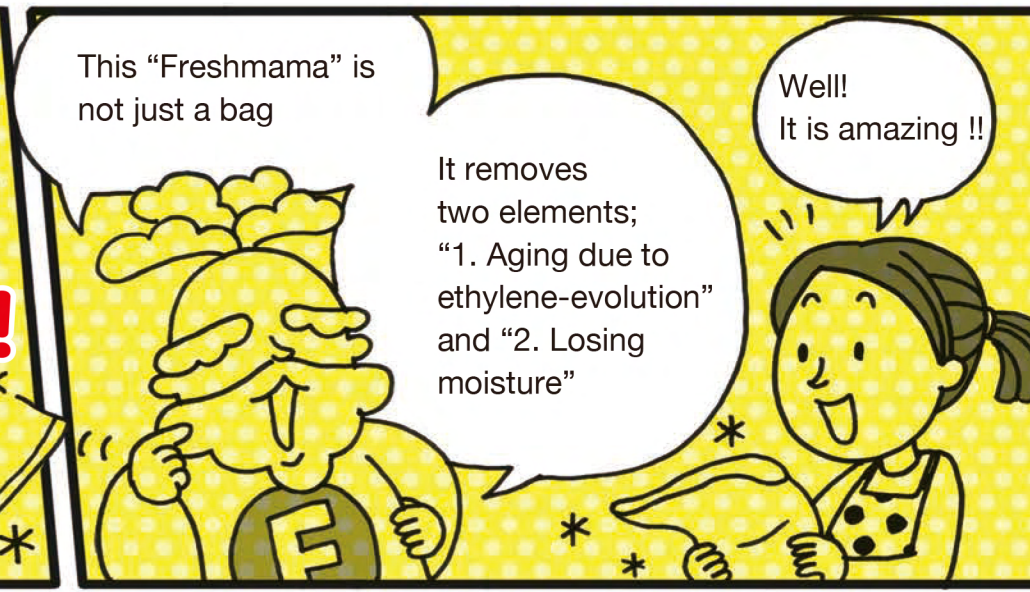
 **NSK** Nissan Steel Industry

[www.npo-jiipa.org/trade/](http://www.npo-jiipa.org/trade/)

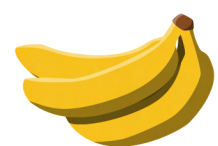


Like a mother keeps fresh every day!

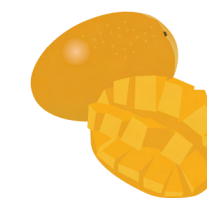
# What is Freshmama?







# “New technology to keep green vegetables and fruits fresh for longer time”



## PRODUCT SUMMARY

### Vegetable preservation technology by control ethylene gas (※International patent under process)

Ethylene gas, which is the cause of aging of fruits and vegetables, is efficiently decomposed into carbon dioxide and water even in the dark, and the generated carbon dioxide and water contribute to maintaining the freshness of food! The validation test at the Institute of Scientific and Industrial Research Osaka University, has proven innovative functions not found in the past.

### Amazing function

Ethylene gas drops sharply after 3 hours of using the Freshmama and almost to zero after 6 to 24 hours. Even in the absence of light, in the refrigerator, the decompose function is unchange.

Compared to commercial bags, Freshmama keep fresh for about 7 to 14 days at room temperature.

(※ refrigerated for 30 to 45 days).

### How to use

In case of saving bags, put newspaper or kitchen paper with high water absorbency in and close the bag with a little air left.

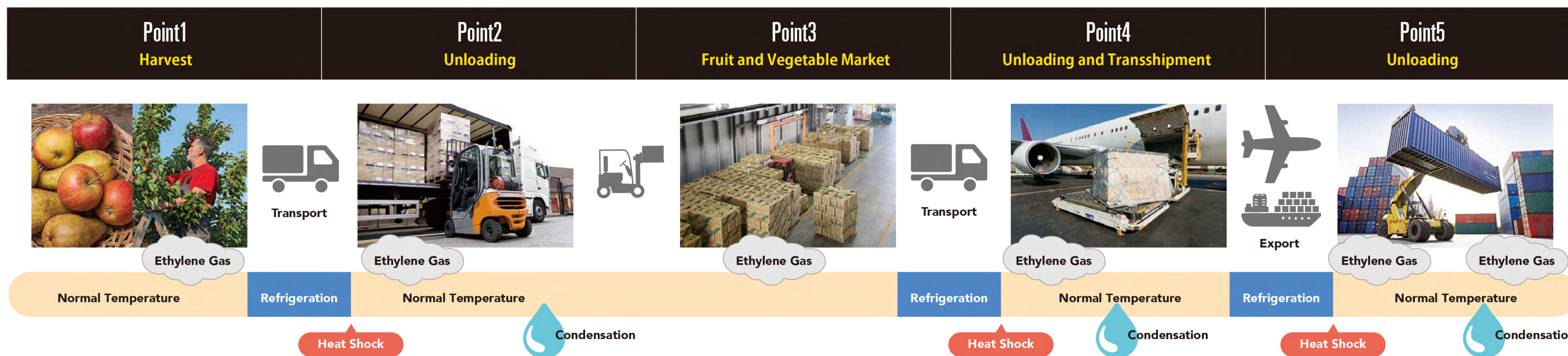
In the case of storage in carton (during transportation), should be preserved the Freshmama above vegetables and paste the box with tape.

Freshmama can be reused.



## Storage and preserve of fresh fruits and vegetables during transportation

Freshmama contributes to keeping freshness and increase the nutritional value of fruits and vegetables of during storage and transportation (e.g. Mango, Papaya, Banana, Strawberry, Apple, etc....).





# Ethylene decomposition/excretion test

## Test outline

We have conducted experiments to confirm that the ethylene decomposition pad developed has ethylene decomposition and excretion activity. The verification tests were conducted as follows: 2 liters of a standard ethylene gas of 10 to 300 ppm was sealed in a sample bag, and the change in the ethylene concentration in the bag with time was measured using a semiconductor gas sensor detector gas chromatograph, using SGHA-P2 GL. As a result of the analysis, it was revealed that ethylene was decomposed by about 80% ethylene, about 130 µg in about 3 hours (Fig 1 and 2).

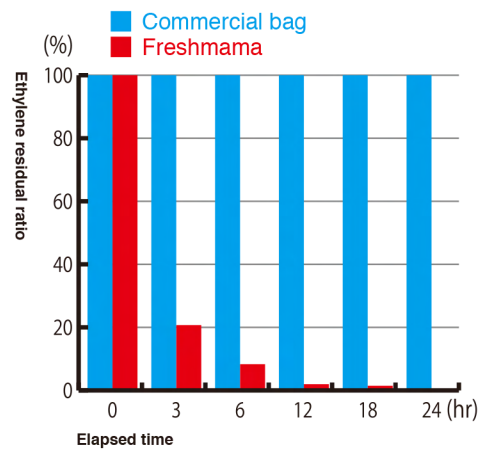
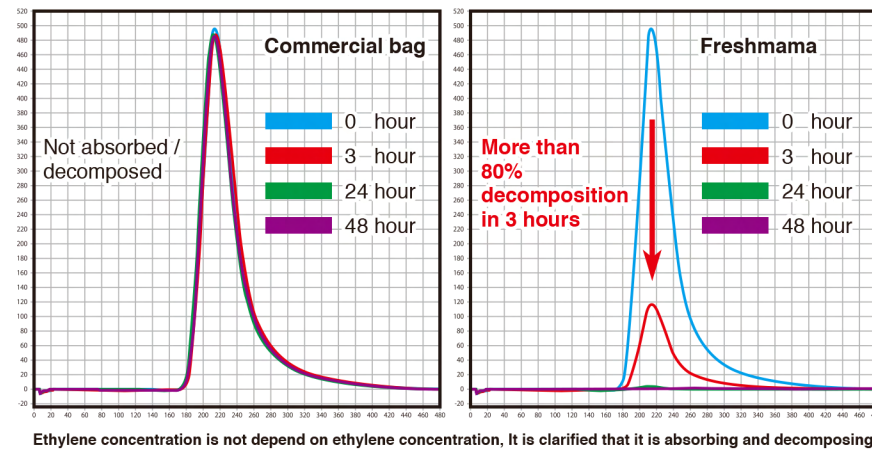


Figure 1: Ethylene damping effect



Ethylene concentration is not depend on ethylene concentration, It is clarified that it is absorbing and decomposing.  
Figure 2: Comparison of measurement data

# Papaya demonstration test



Without Freshmama



More than **30% Loss**



With Freshmama



Less than **5% Loss**

# Verification experiment using fruits and vegetables

In order to investigate whether the fruit-derived ethylene gas was decomposed, the same amount of mini-tomatoes were enclosed in the sample bag and the control bag, and after 3 hours, 20 hours, 44 hours, 68 hours and 92 hours in the bag of ethylene gas concentration was measured. As a result, it was clarified that the ethylene concentration increases in the control bag, while the accumulation of the ethylene gas in the sample is suppressed to within 0.6 ppm.

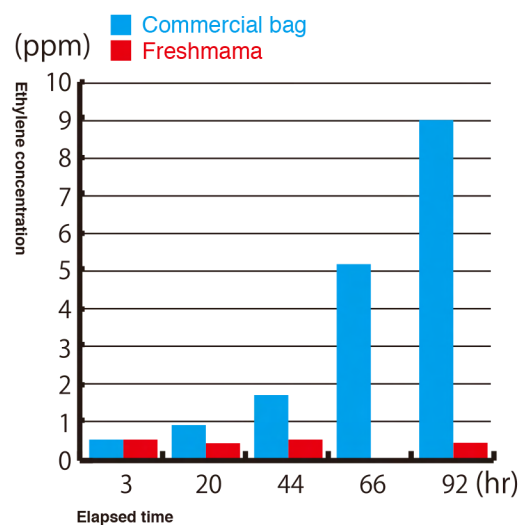


Figure 3: Ethylene decomposition inhibitory effect from mini tomatoes



Commercial bag

"Water appeared on these tomato surfaces and corroded."



Freshmama

Maintain fresh state

# CONCLUSION

This document has demonstrated the ability to decompose a high concentration of ethylene in a short time. Investigation of the gas concentration in the sample bag after decomposition of ethylene has confirmed this pad not only decomposed ethylene gas, but also excreted as carbon dioxide in water. Verification experiment was carried out on tomatoes, mini tomatoes, spinach ... and also showed that this material has a fresh preservation effect.



Bought a banana in the middle of September at the retail store, divided the same tuition into two ⇨ Leave at room temperature for 3 days

Peach  
Leave at ambient temperature for 21 days

