

AVRDC
The World Vegetable Center

34th International Vegetable Training Course
"Vegetables: From Seed to Table and Beyond"
14 September to 4 December 2015

**FRESH-CUT
FRUIT & VEGETABLES**



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Convenience Foods

Food that needs little preparation :
Easy to Cook / Ready to Eat

Shorten the time of meal preparation at home:
Some can eat immediately or after adding water,
heating or thawing: canned, dried, frozen produce and
Fresh-Cut Fruit and Vegetable

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**Why Do The People Need
Convenience Foods?
(Fresh-Cut Fruit and Vegetables)**

- ☺ **Price** Cost reduction
- ☺ **Health** Nutraceutical
- ☺ **Hygiene** Minimize risk and hazard
- ☺ **Lifestyle** Efficiency : We are all busy, we want food on the go
- ☺ **Choice** Exotic fruit and vegetable



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Why do we **NEED to do fresh cut?**

- ▶ **Market (Consumers) Need**
 - The haste in daily life
 - Convenience food / easy to cook / easy to eat
 - Too big fruit / Difficult to peel
 - Belief in quality and safety
- ▶ **Understandard produces (defect, size, color, etc.)**
 - Gain income / Value added
- ▶ **Reduce garbage transportation**
 - Value added from waste

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DEFINITION
(IFPA, 2000 ; Watada *et al.*, 1996 ; Rolle and Chism,1987)

Fresh-cut products :

Fruits or vegetables **intended to be consumed raw** that have been **trimmed, peeled, sliced, shredded, cored and/or cut** into 100% usable product that is subsequently **packaged** to offer consumers high nutrition, conveniences and flavor while **maintaining highly perishable freshness**. **The tissue is still alive!!**

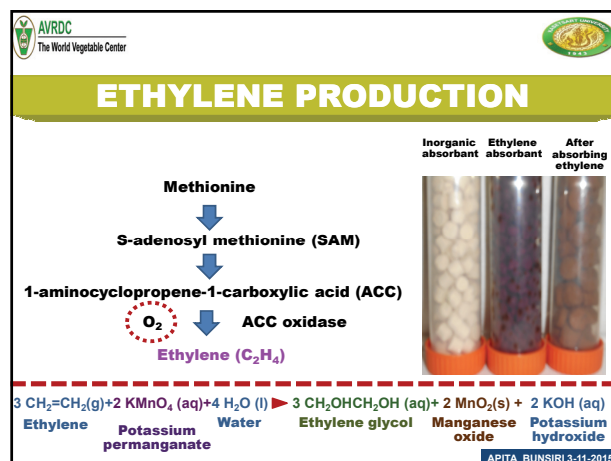
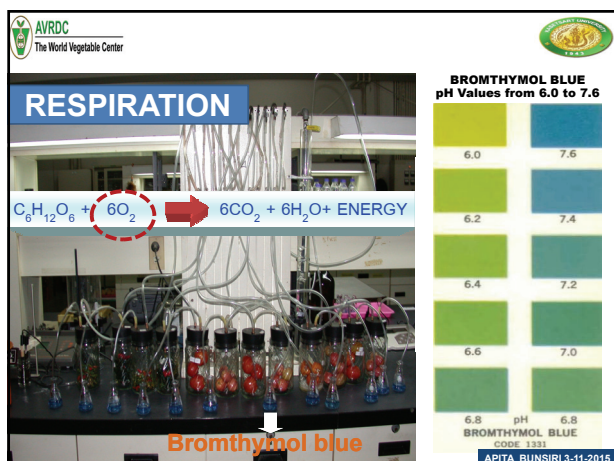
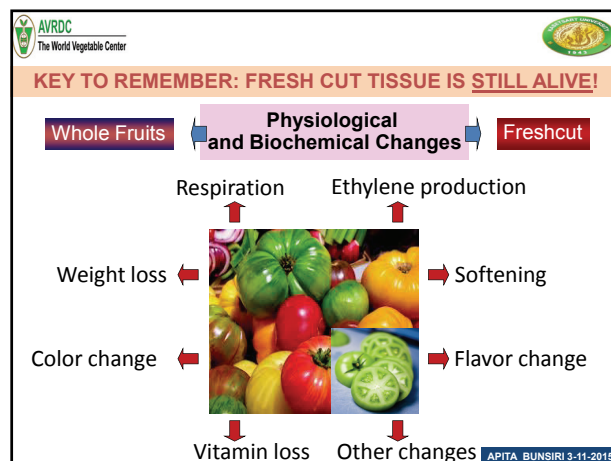
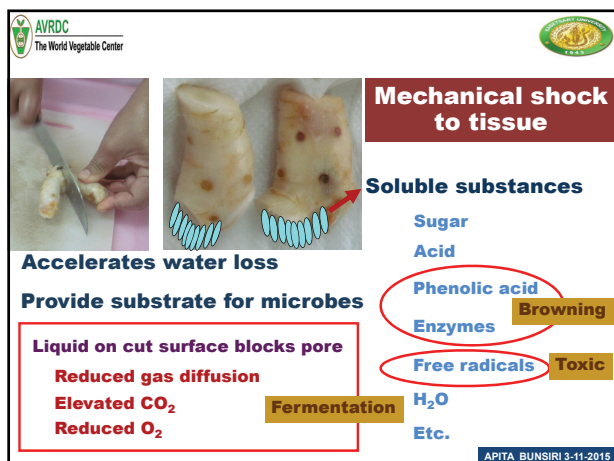
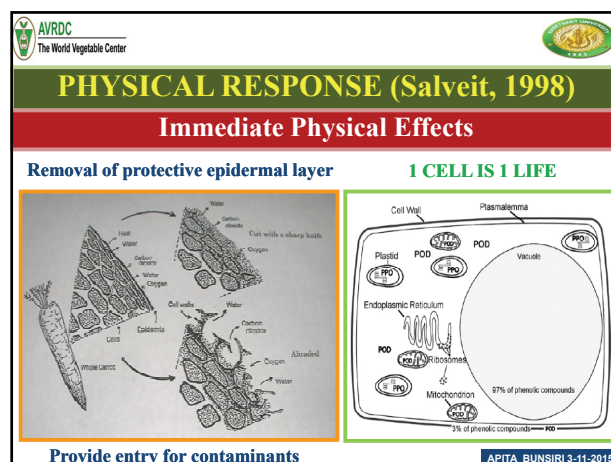
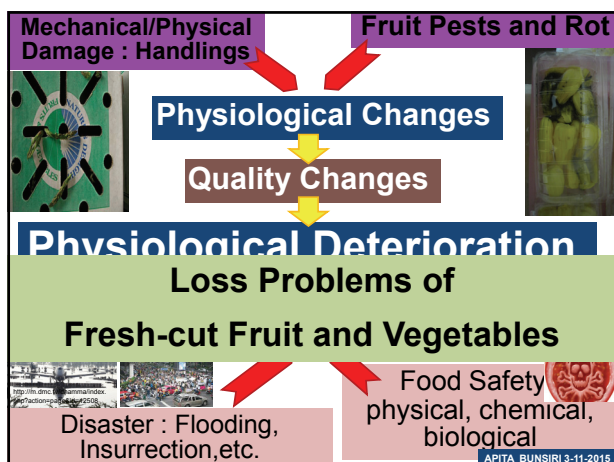
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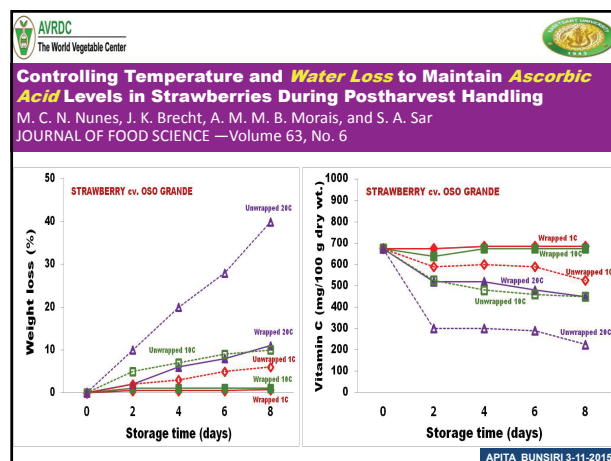
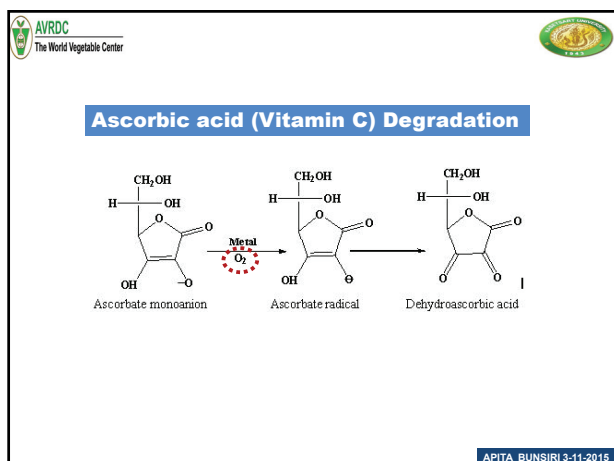
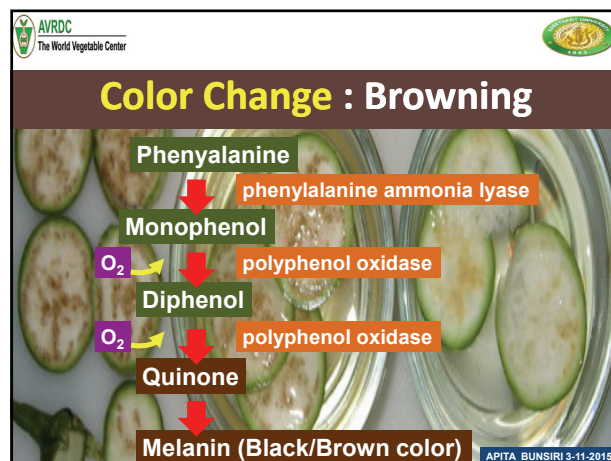
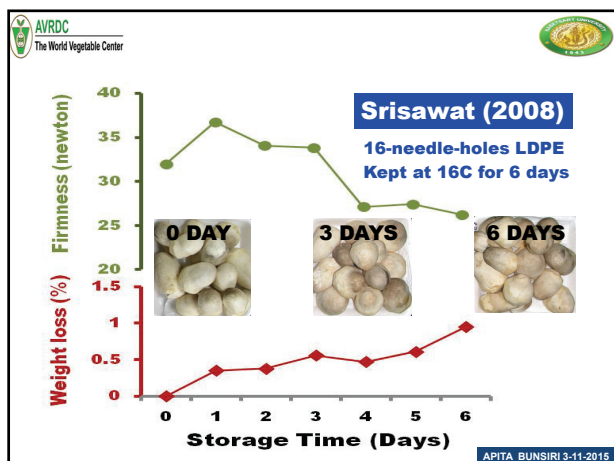
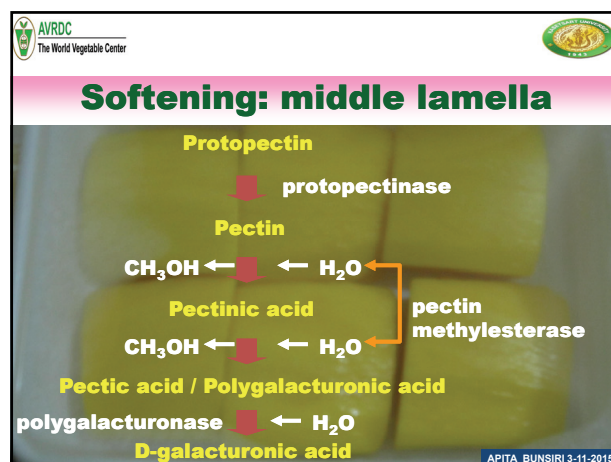
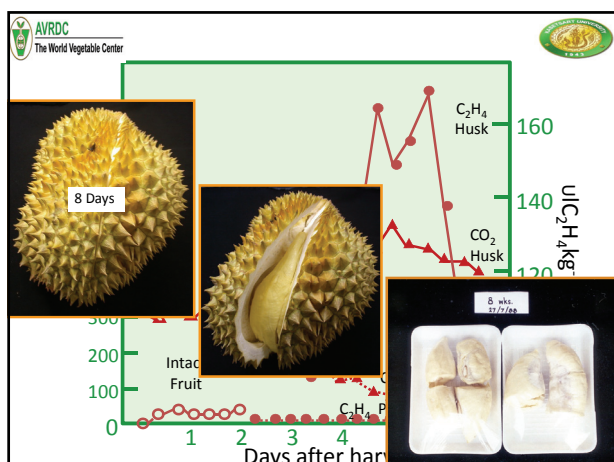
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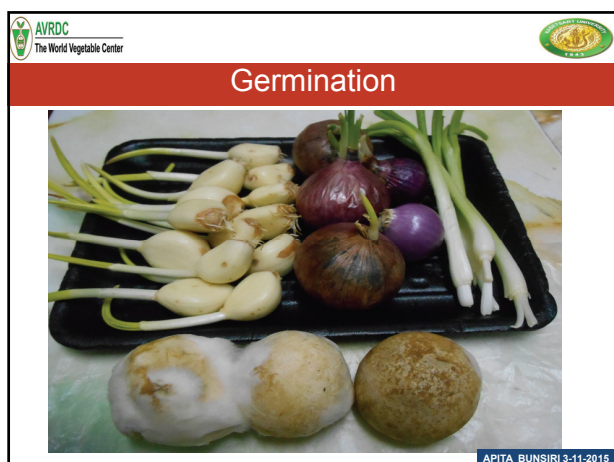
WOUND FROM FRESH CUT



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Foodborne pathogen found on fresh-cut jackfruit with and without edible solution coating stored at 12°C for 12 days

Pathogen	Standard guideline	Treatments	Day0	Day12
Aerobic plate count	<6x10 ⁵ CFU/g	Control	4.00x10 ⁴	6.70x10 ⁵
		RF-I	8.78x10 ³	6.60x10 ⁴
		RF-II	3.40x10 ³	2.40x10 ⁵
Coliform bacteria	<6x10 ⁵ CFU/g	Control	4.00	1.10x10 ⁵
		RF-I	0.00	1.20x10 ⁴
		RF-II	0.00	2.40x10 ¹
Yeast	<10 ⁴ CFU/g	Control	1.60x10 ¹	2.10x10 ³
		RF-I	0.00	4.00
		RF-II	1.80x10 ¹	3.10x10 ³
Mold	<10 ⁴ CFU/g	Control	0.00	4.00x10 ²
		RF-I	0.00	4.00
		RF-II	0.00	4.00

S. aureus *E. coli* *Salmonella* spp. **Control** **RF-I** **RF-II** **nd**

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Residues (ppm) of pesticides in various portions of unwashed carrots

Portion	Cypermethrin	Diazinon	Parathion
Whole carrot	0.012 (1X)	0.016 (1X)	0.035 (1X)
Crown	0.12 (10X)	0.25 (16X)	0.82 (23X)
Peel	0.021 (1.8X)	0.039 (2.4X)	0.059 (1.7X)
Peeled carrot	nd (0X)	nd (0X)	nd (0X)

Burchat et al., 1998, Food Additives and Contaminants, 15(1):61

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Mechanical/Physical **Fruit Pests and Rot**

SOME :
Can Control

SOME :
Out of control

Insurrection, etc.

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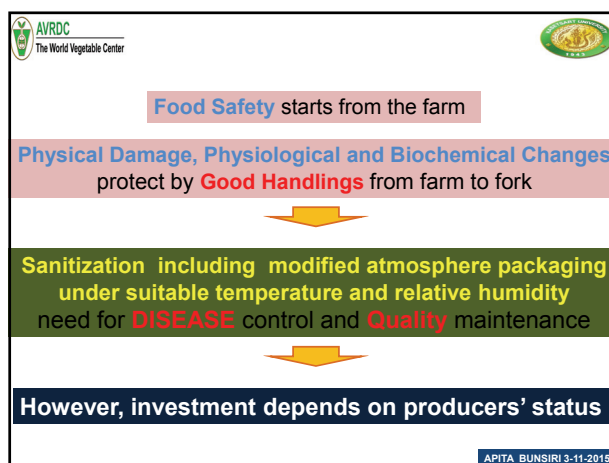
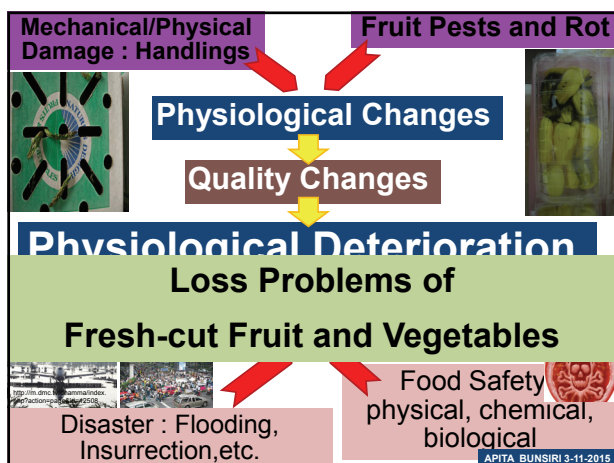
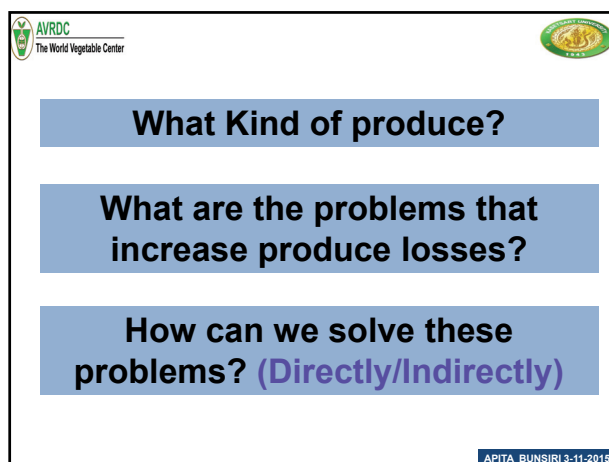
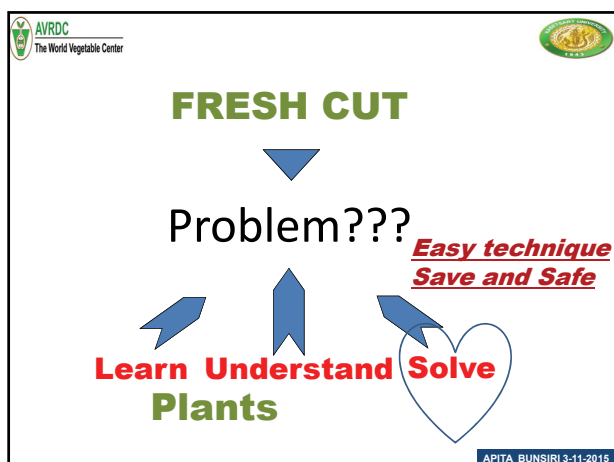
How to produce

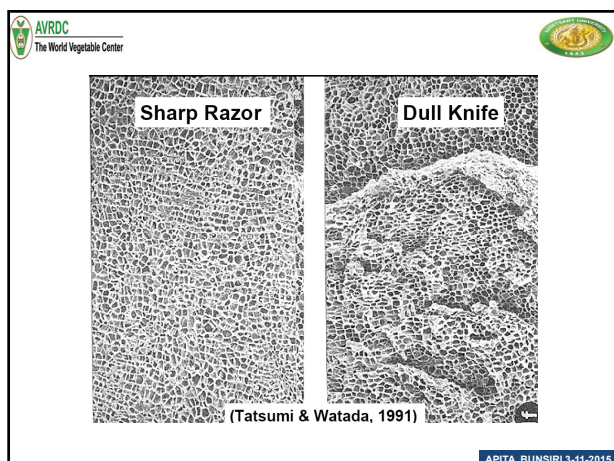
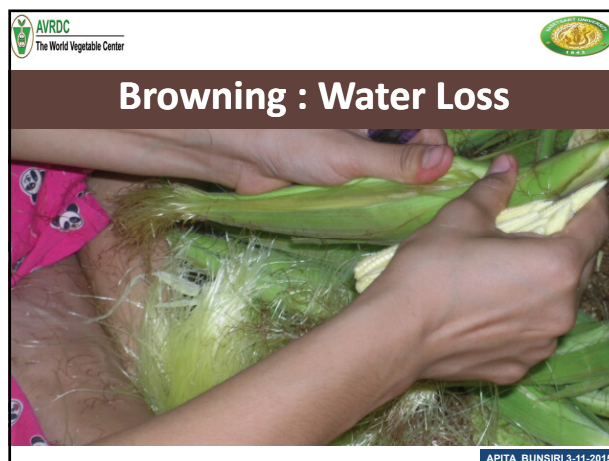
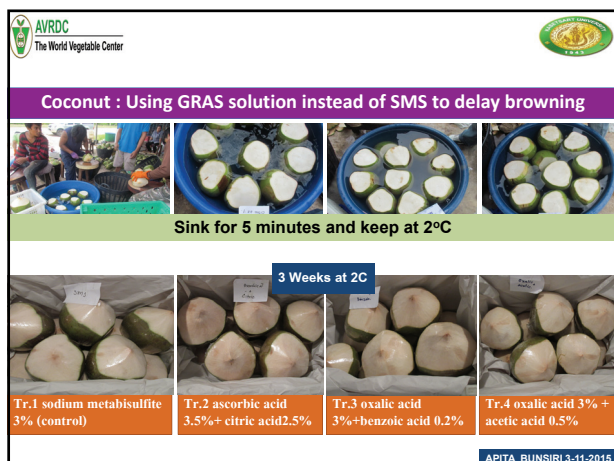
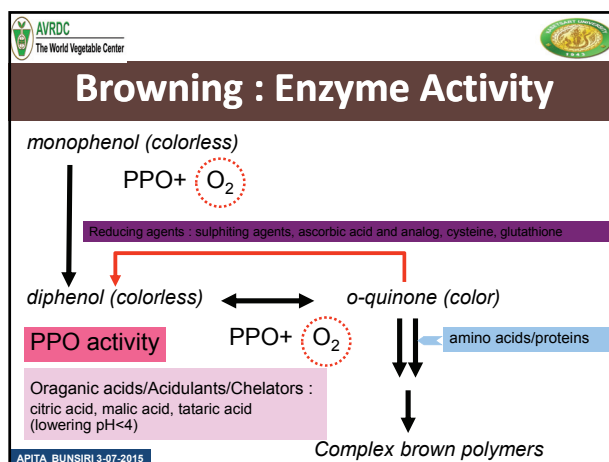
Good

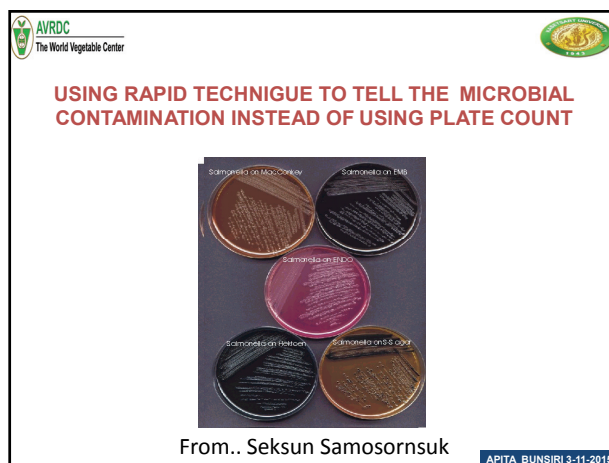
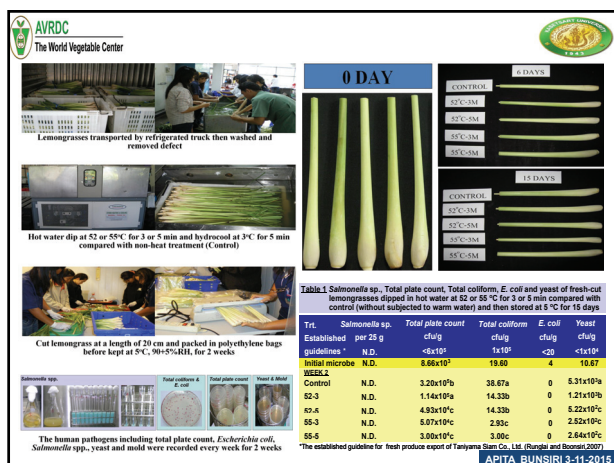
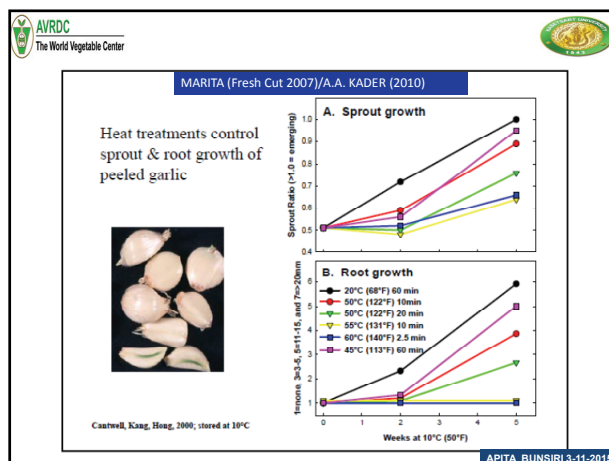
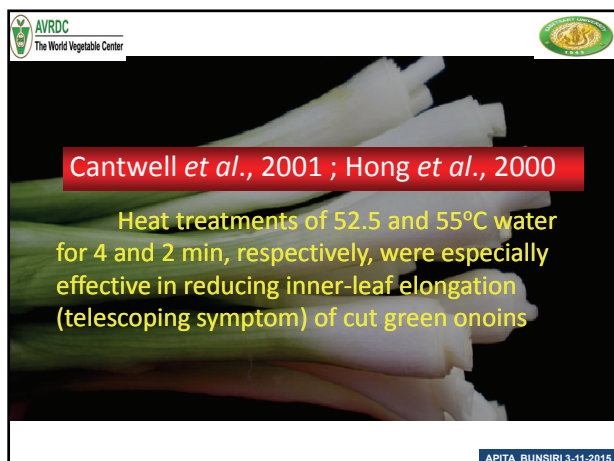
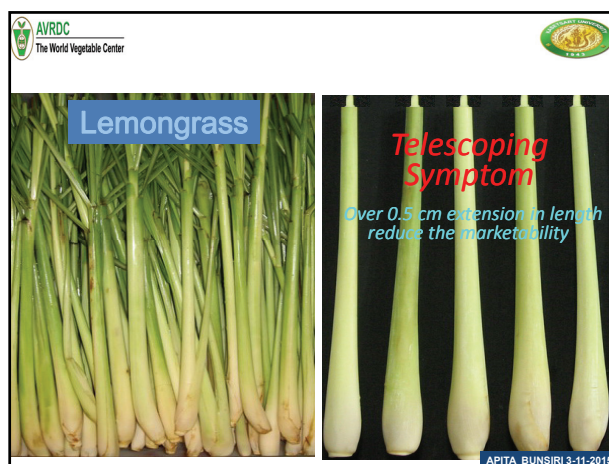
Convenience Foods
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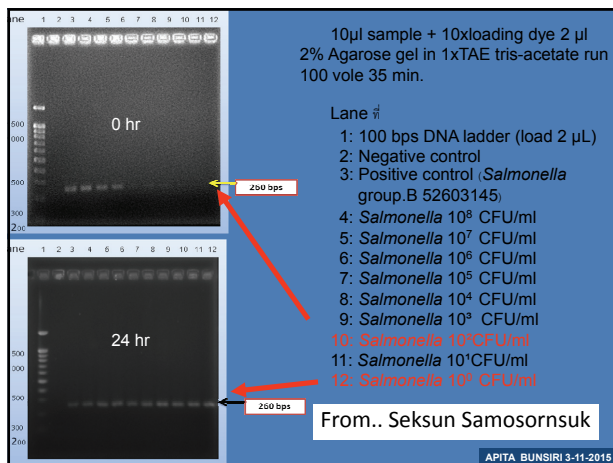
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USE INDICATOR FOR DETERMINING THE DETERIORATION DEGREE

-RIPENING

<http://www.dailymail.co.uk/news/article-1127504/Colour-coded-sensor-labels-tell-customers-perfect-time-eat-fruit.html>

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RISK OF MICROBIAL CONTAMINATION

MICROBIAL INDICATOR

Metabolite :
CO₂, SO₂, NH₄, H₂S,
Organic acid (acetic, lactic) + pH Dye

Salmonella spp
Bacillus cereus
Staphylococcus aureus
Listeria monocytogenes
Escherichia coli O157:H7
Yersinia enterocolitica

Oxalis triangularis

Pigment indicator
pH 4.0-5.0
+ Alginate as absorber

Guideline : pH ≤ 4.6

Starch and sugar → Lactic acid (pH ≤ 4.6)
Lactobacillus

SAFE DANGER

http://www.mtec.or.th/index.php?option=com_content&task=view&id=1016&Itemid=176

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MICROBIAL INDICATOR

Metabolite :
Alcohol (ethanol) + Enzyme → Substrate + Color Dye
Amine (thiramine)

http://www.tistr-foodprocess.net/download/article/food_safety_issues_th.htm

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Maintain quality & shelf life of fresh product

1. Use highest quality raw material
2. Minimize mechanical damage/sharp knife
3. Rinse cut surface/remove excess water
4. Maintain strict sanitation/chlorinated water
5. Use appropriate package and atmosphere
6. Maintain product quality at 1-5°C

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THANK YOU

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