Technical Seminar

Application of pH Adjuster

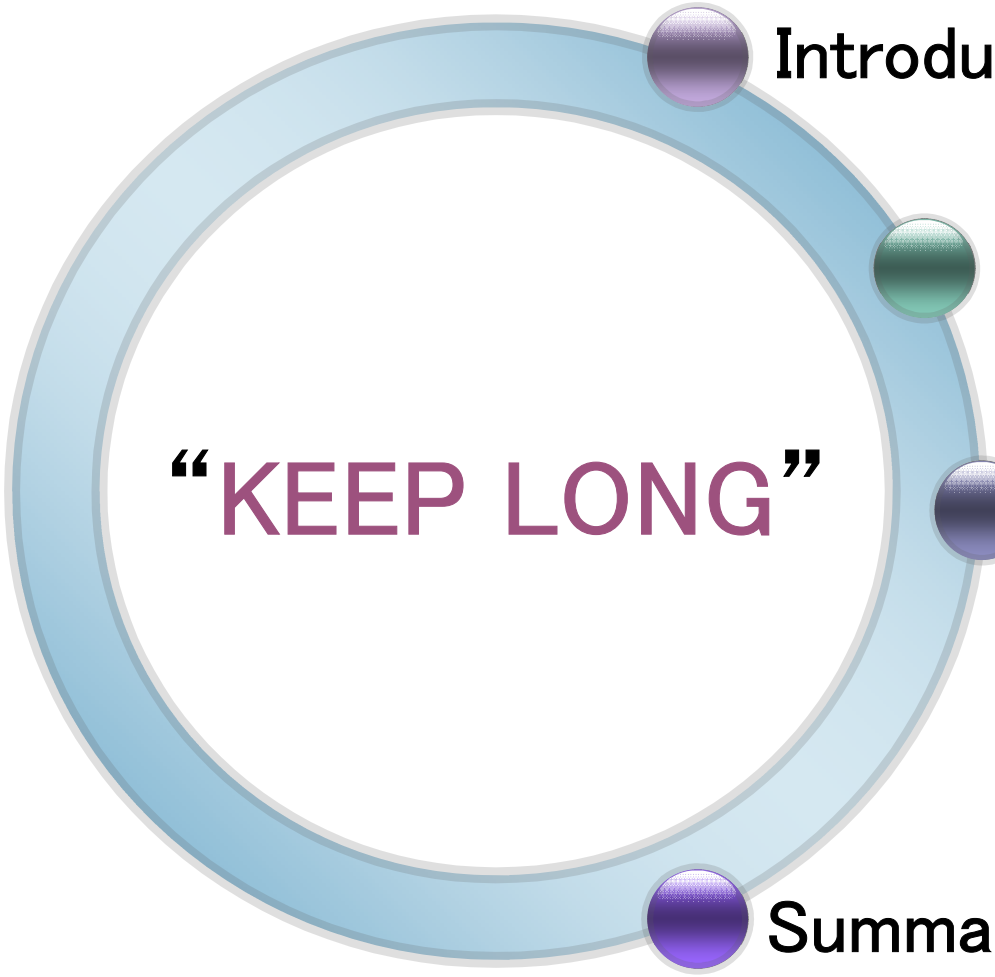
"KEEP LONG"

December 2, 2011

UENO FINE CHEMICALS INDUSTRY (THAILAND), LTD

Y. Furukawa (R&D Manager)

Contents



Introduction

About "KEEP LONG"

Applications of "KEEP LONG":

1) Fried Chicken 2) Fried shrimp
3) Bread 4) Butter cake

Summary

UENO

Introduction

❖Definition of food hygiene

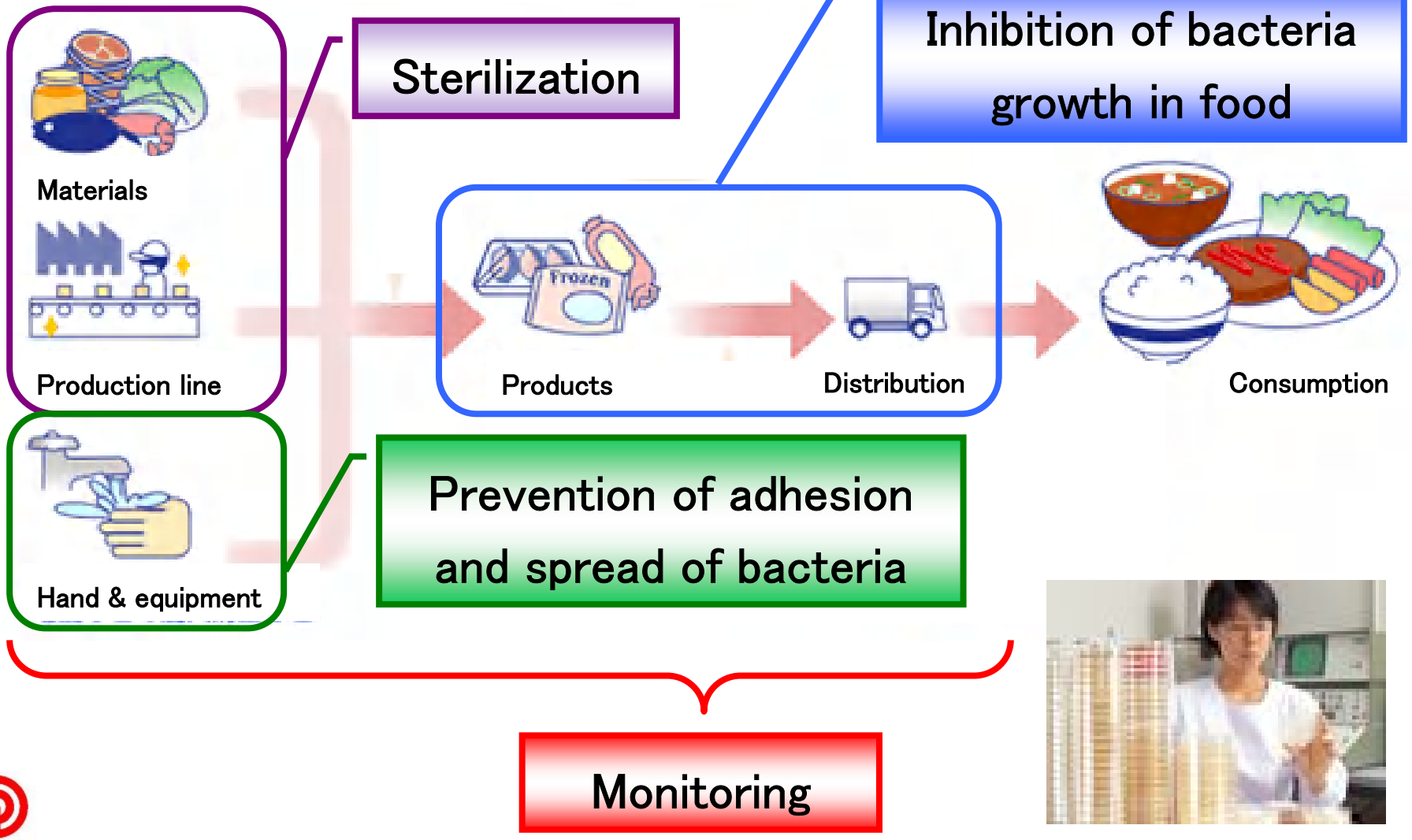
"Food hygiene" means all measures necessary for ensuring the safety, wholesomeness, and soundness of food at all stages from its growth, production or manufacture until its final consumption.

WHO

UENO

Introduction

❖Total sanitation of UENO



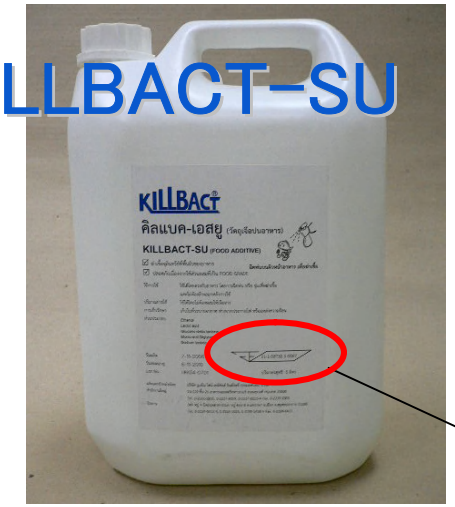
Introduction

❖Sanitation by “CIDALLY” & ”KILLBACT”

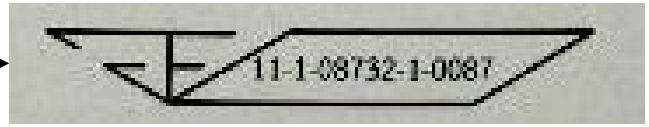
CIDALLY

- Easy to use as 2 in 1 (Cleaning & Disinfection)
- High efficiency in low concentration
- No problem of corrosiveness for most of materials

KILLBACT-SU



- Consists of alcohol and water, with food additives
- Possible to sterilized hand, utensils, work table and also food directly
- To be effective even though under wet condition



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Introduction

❖Sanitation by “CIDALLY” & ”KILLBACT”

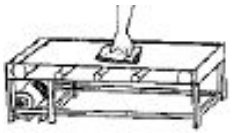
During manufacturing



Sterilization of Operator’s Hands, Equipments & Food surface by KILLBACT-SU

After manufacturing

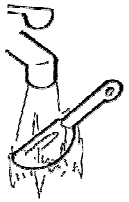
Remove dust



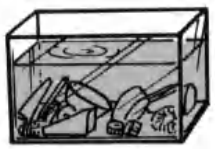
Scrub with CIDALLY

Rinsing

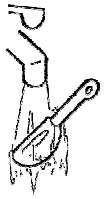
Spray KILLBACT-SU



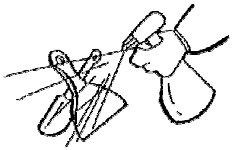
Remove dust



Scrub and soak with CIDALLY overnight



Rinsing



Spray KILLBACT-SU

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Introduction

❖Typical bacteria involved in food hygiene

Classification	Type of food	Growth inhibitor				Heat resistance	Remarks
		Low-Temp	Low-Aw	Low-pH	Low-O2		
Bacteria	All food	○	○	○	○	○	
Bacillus	Heated food (Rice, beans)	×	×	×	×	○	Spore formation
Staphylococcus	All food	×	○	△	△	×	
Pseudomonas	Fish, Meat	○	×	×	×	×	
Vibrio	Seafood	×	×	×	△	×	
Enterobacteriaceae	Livestock products (Meat, Milk, Egg)	×	×	△	△	×	*Coliform*; contamination index
Lactic acid bacteria	Cool-stored foods (Dairy products, Pickles)	○	△	○	△	×	
Clostridium	Packed foods (Sausages, Canned foods)	△	×	×	○	○	Anaerobic Spore formation
Mold	Low-moisture foods (Bakery, Fruits)	×	○	○	×	△	Spore formation
Yeast	Beverage, Seasoning	×	△	○	△	×	Anaerobic fermentation

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❖Food poisoning bacteria

Bacteria name	Characteristics of symptom	Distribution	Countermeasure
Salmonella Enterobacteriaceae	Consumption for illness: ≧10^2 Incubation period : 12–24 Hr Symptom : Diarrhea, Vomiting, Fever Recovery time : 2–3 days	Animal feces Contaminated materials: Egg, Meat, Milk	Heating process Cold storage Heating before eating
Vibrio parahaemolyticus	Consumption for illness: ≧10^6 Incubation period : 8–20 Hr Symptom : Diarrhea, Stomachache, Fever Recovery time : 2–3 days	Seafood	Washing with Freshwater Heating process Cold storage: ≦10 ℃ Heating before eating
Staphylococcus aureus	Consumption for illness: ≧10^5 Incubation period : 1–5 Hr Symptom : Diarrhea, Vomiting Recovery time : 1–2 days / Mild	Operator: Wound, Cough Contaminated materials: Milk	Heating process Cold storage: ≦10 ℃ (The toxin is heat-resistant)
Listeria monocytgenes Enterobacteriaceae	Consumption for illness: ≧10^3 Incubation period : 6 Hr – 10 Weeks Symptom : Meningitis, Sepsis Recovery time : Opportunistic infection Notices: 20–30 % / Fatality rate	Soil Animal feces	Removal of soil Heating process Cold storage: ≦4 ℃ Heating before eating
Clostridium botulinum	Consumption for illness: ≧10^2 Incubation period : 12–36 Hr Symptom : Neurological Recovery time : 2–3 Weeks / Mild Notices: 20 % / Fatality rate	Soil Animal feces	Removal of soil Cold storage: ≦3 ℃ Heating before eating

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Introduction

❖Japanese social background & UENO

Background	Demand	Problem	UENO
1940–1960 **Postwar rise**	Quantity	Ensuring safety	Preservatives
1960–1980 **Rapid economic growth**	Safety Abundance	Extension of shelf life Degradation during storage	New preservatives Improving agent
1980–2000 **Age of satiety**	Healthy (Chemical free)	Low salt, Low sweet Non sugar (Non preservatives)	Sanitation Analysis service **pH adjuster** Oxygen absorber
2000– Present **Age of confusion**	Natural Domestic	Misunderstanding for food additives	Providing accurate information

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About “KEEP LONG”

❖Active ingredients in “KEEP LONG”

Main component	Properties	Antibacterial activity
Sodium acetate CH_3–COO·Na	The antibacterial activity is the strongest among organic acids. Crystalline powder pH of solution: ＞8	Inhibition effect (pH6 or less) Wide range of antimicrobial activity spectrum
Fumaric Acid HOOC–CH=CH –COOH	The force of the pH control in food is the strongest among organic acid. Crystalline powder pH of solution: 3	Sterilization effect by low pH (Improvement of heat sterilization effect) Improve the antibacterial activity of other organic acids

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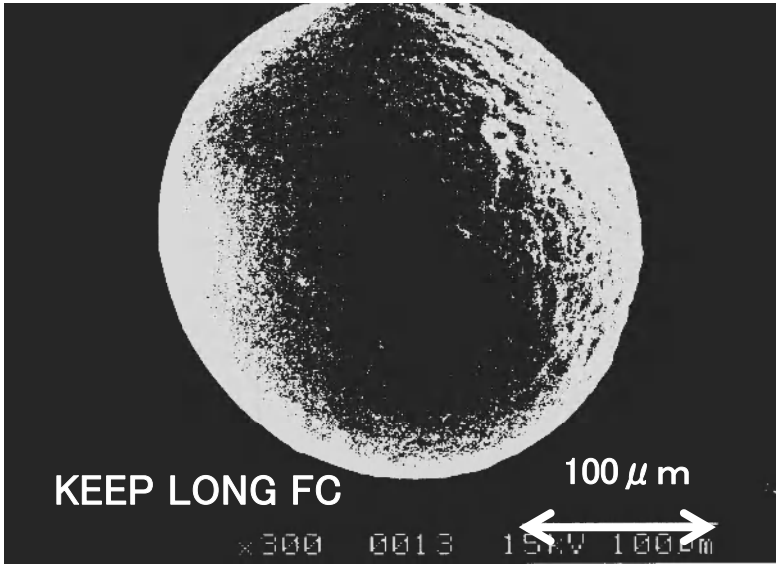
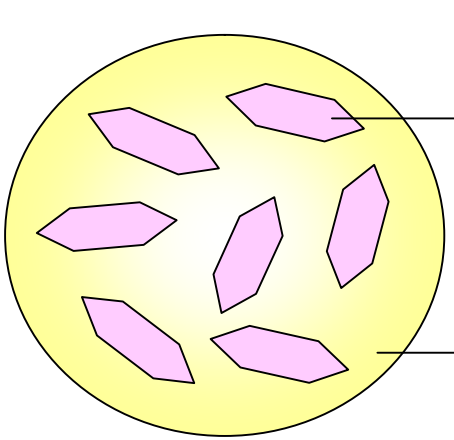
About “KEEP LONG”

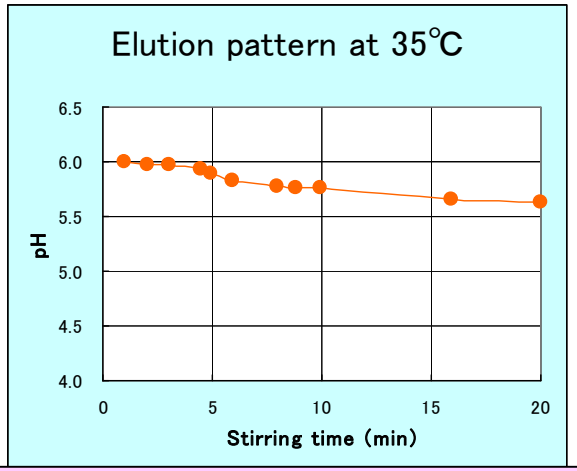
❖Coating technology



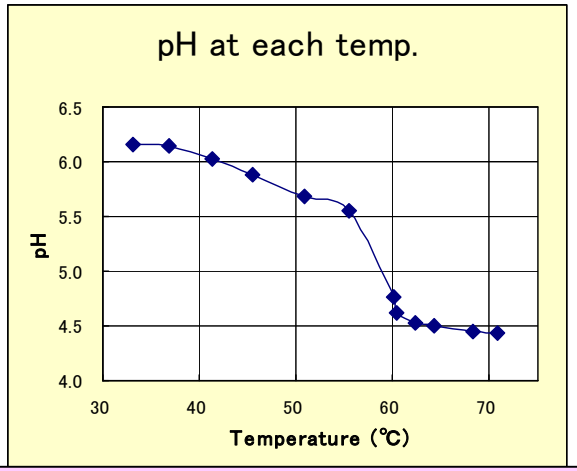


Fumaric acid

Hydrogenated Palm Oil (m.p. 60℃)



pH is not change in water.



pH deceases at high temp.

About “KEEP LONG”

❖Lineup

KEEP LONG	Components				Properties
	Fumaric Acid		Na acetate	Others	
	normal	FC			
FC		○			➢It reduces pH, and extends the shelf life of food. ➢It doesn’t affect the physical properties of foods.
SAF		○	○		➢The preservation activity of sodium acetate is enhanced by coated fumaric acid. ➢It doesn’t affect the physical properties of foods.
IM	○		○	○	➢The preservation activity of sodium acetate is enhanced by uncoated fumaric acid. ➢Soluble in water.

10-3-25049-1-0001

10-3-25049-1-0002

10-3-25049-1-0003

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About “KEEP LONG”

❖Applications

Classification	Food		Process	KEEP LONG
Meat products	Sausage, Ham		Mixing	FC, SAF
Seafood products	Crab stick, fish ball		Mixing	FC,SAF
	Frozen seafood, Seasoned seafood products		Soaking	IM
Ready to eat	Fried food (pork, chicken, fish, shrimp)		Soaking	IM
			Pre-dust	SAF
			Butter	SAF
	Roasted chicken (Yakitori)		Soaking	IM
			Seasoning sauce	IM
	Processed food	Hamburg steak, Okonomiyaki, Takoyaki, Rolled cabbage, Stewed pork	Mixing	SAF, IM
		Meat bun, Dumpling	Mixing	SAF,IM
Bakery products	Bread, Cake & Cream		Mixing	SAF
Others	Pickle		Seasoning sauce	IM
	Noodle		Mixing	SAF, IM

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Application of “KEEP LONG”

Deep fried chicken

- Soaking → KEEP LONG IM
- Pre-dust → KEEP LONG IM or SAF

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Application of “KEEP LONG”
Deep fried chicken

How to cook

1) Chicken (cut ~ 1 inch)

~ 500 g./condition

2) Soaking (30 min)

Soaking solution: Chicken = 1:1

3) Pre-dust (Wheat flour)

~ 150 g/condition

4) Deep fried (175° C, 4 min)

~ 3 liter/test (5 conditions)

5) Wait in room temp ~ 30 min.

Cool down before keep and microbial check

6) Microbial test

Storage at 30℃ 3 days

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Application of “KEEP LONG”

Deep fried chicken

Test item

- **Food hygiene point**

  Insufficient heating, Heat resistance spore

- **Selection of “KEEP LONG”**

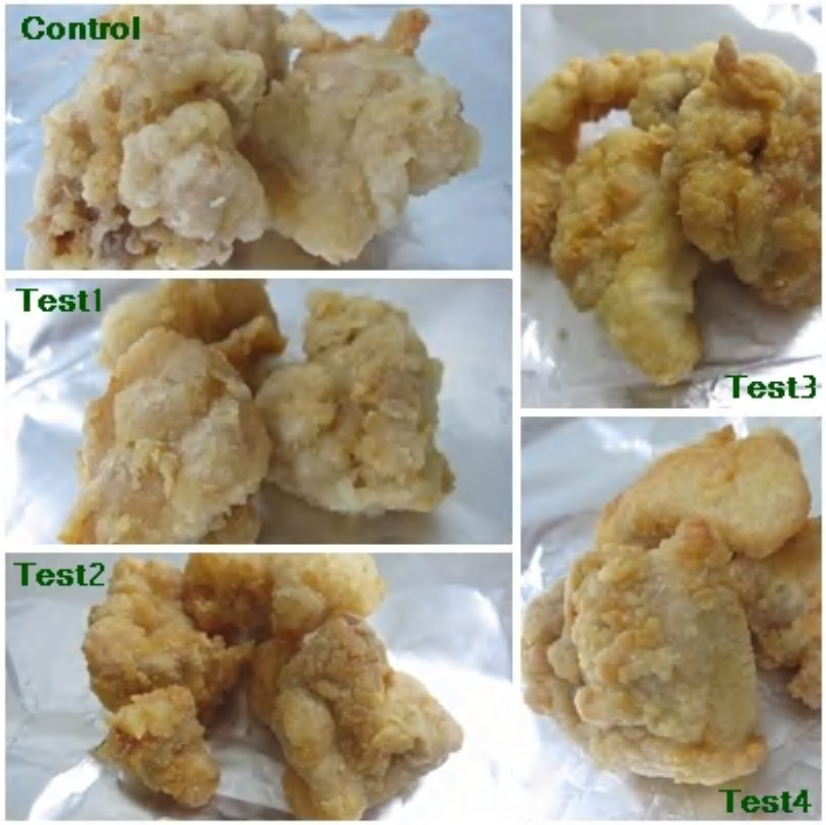
  IM for soaking, IM or SAF for pre-dust

- **Analysis item**

  Microbial test (TPC), Sensory test

Condition	Soaking	Pre-dust
Control	No	No
Test 1	No	IM 5%
Test 2	No	SAF 5%
Test 3	IM6% KB-SU 2% MU-45 5%	IM 5%
Test 4	IM6% KB-SU 2% MU-45 5%	SAF 5%

Appearance



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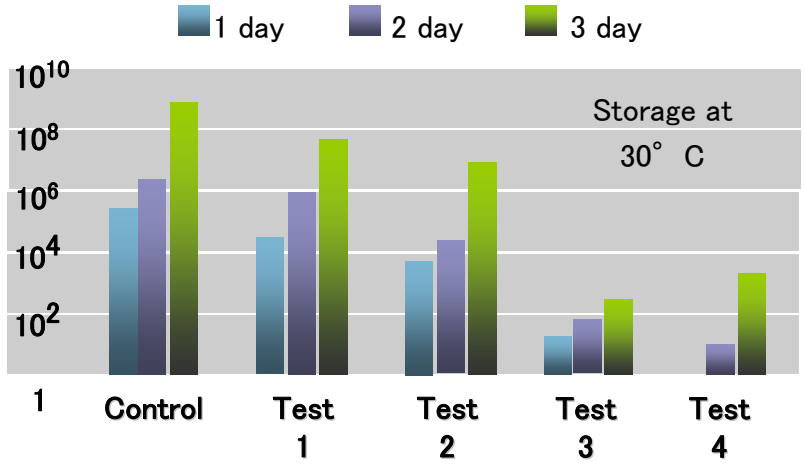
Application of “KEEP LONG”

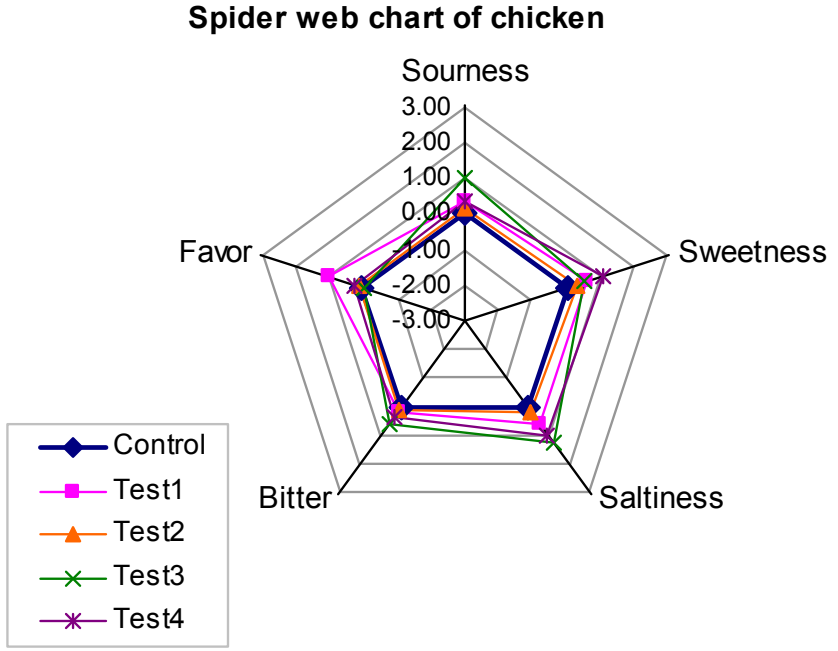
Deep fried chicken

Microbial test: TPC (cfu/g)



Condition	Soaking	Pre-dust
Control	No	No
Test 1	No	IM 5%
Test 2	No	SAF 5%
Test 3	IM6% KB-SU 2% MU-45 5%	IM 5%
Test 4	IM6% KB-SU 2% MU-45 5%	SAF 5%

Sensory test



- Preservation (TCP<10^5 / 30℃ 2 days)

  Test 2,3,4 OK

- Sensory

  Test 1, 2, 3, 4 OK

Application of “KEEP LONG”

Fried shrimp

- **Soaking → KEEP LONG IM**
- **Pre-dust → KEEP LONG IM or SAF**
- **Butter → KEEP LONG IM or SAF**

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Application of “KEEP LONG”

Fried shrimp

How to cook

1) Prepare shrimp

   1.1 Raw shrimp

   1.2 Take off head & cover

   1.3 Pull off black line at the back

   1.4 Cut (across) abdomen then bend to straight

2) Wash

3) Soaking

   Soaking solution: Shrimp = 1:1

4) Pre-dust (dip in wheat flour)

5) Dip in batter mix

6) Dip bread crumbs

7) Fried (180° C, 2 min)

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Application of "KEEP LONG"

Fried shrimp

Test item

- **Food hygiene point**

  Heat resistance spore, Danger zone

- **Selection of "KEEP LONG"**

  IM for soaking, IM or SAF for pre-dust and butter mix

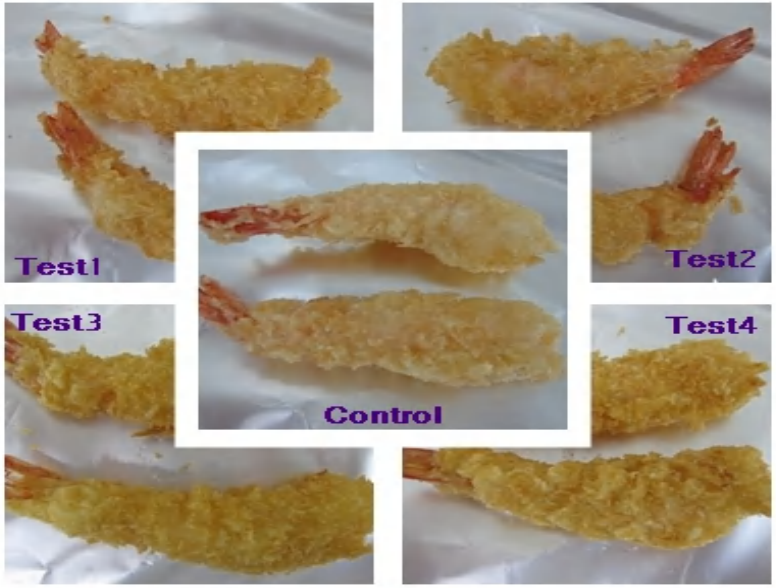
- **Analysis item**

  Microbial test (TPC), Sensory test

Condition	Soaking	Pre-dust	Batter mix
Control	No	No	No
Test 1	No	IM 10%	IM 2%
Test 2	No	SAF 10%	SAF 2%
Test 3	IM6% KB-SU 2% MU-45 5%	IM 10%	IM 2%
Test 4	IM6% KB-SU 2% MU-45 5%	SAF 10%	SAF 2%

Danger zone

Appearance



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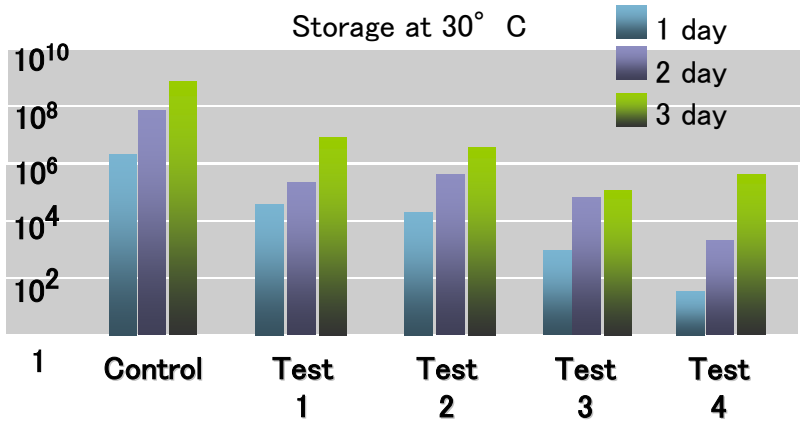
Application of “KEEP LONG”

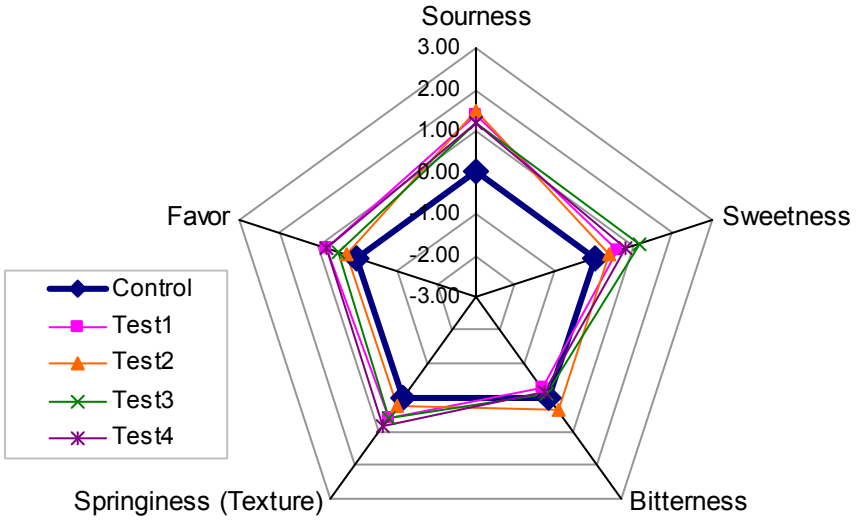
Fried shrimp

Microbial test: TPC (cfu/g)



Condition	Soaking	Pre-dust	Batter mix
Control	No	No	No
Test 1	No	IM 10%	IM 2%
Test 2	No	SAF 10%	SAF 2%
Test 3	IM6% KB-SU 2% MU-45 5%	IM 10%	IM 2%
Test 4	IM6% KB-SU 2% MU-45 5%	SAF 10%	SAF 2%

Sensory test



- Preservation (TCP<10^5 / 30℃ 2 days)

  Test 3,4 OK

- Sensory

  Test 1, 2, 3, 4 OK

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Application of “KEEP LONG”

Bread

- ❖Performance enhancement of preservatives by KEEP LONG FC
- ❖Non preservative by KEEP LONG SAF

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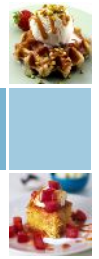
Application of “KEEP LONG”

Bread



How to make

1. Prepare yeast solution: dry yeast + water (3 teaspoon) + sugar (~0.5g), incubate ~ 37° C, 10 min
2. Flour + water + milk + sugar, mix together in bowl
3. Add yeast solution (from1) in the center of mixing flour, then mix together
4. Incubate ~ 37° C, 15–20 min
5. Add butter, salt, vanilla, then use high speed mixture 5 min
6. Thresh flour (by hands) until its can set film
7. Incubate ~ 37° C, 1 hour
8. Spread dough and press 2–3 min, then roll to the mold (already spread shortening at mold)
9. Incubate ~ 37° C, 45–60 min
10. Warm oven, then bake at 165° C, 45 min

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Application of “KEEP LONG”
Bread

Test item

- **Food hygiene point**

  Heat resistance spore, Mold (2nd contamination)

- **Selection of “KEEP LONG”**

  Preservative + FC, SAF

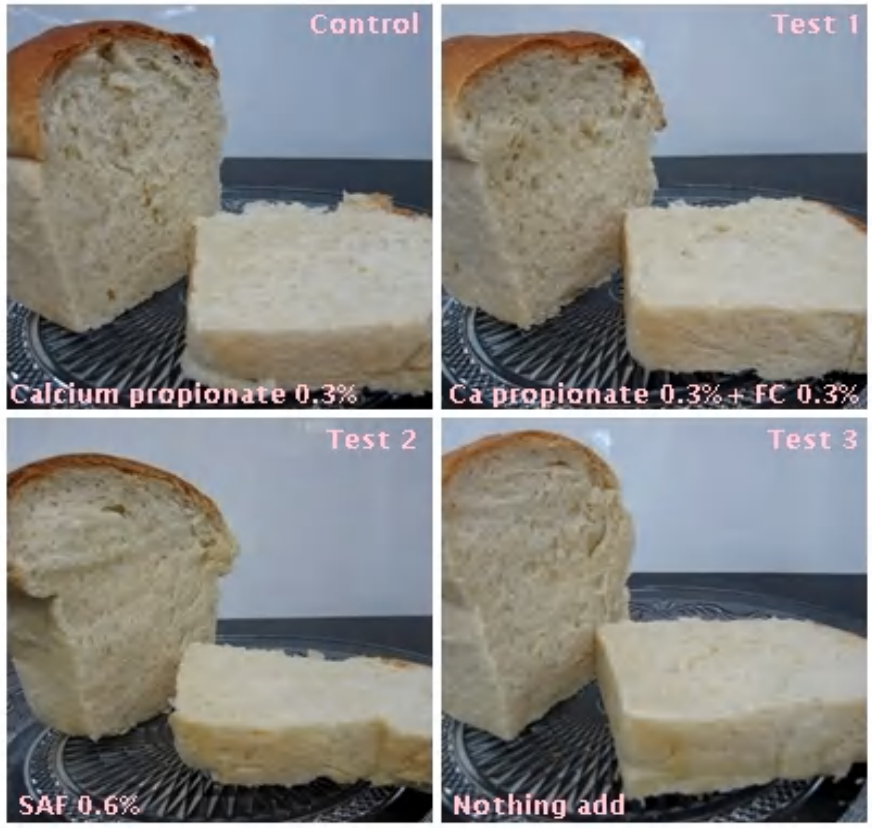
- **Analysis item**

  Bulk density

  Microbial test (TPC), Sensory test

Control	Calcium propionate 0.3%
Test 1	Calcium propionate 0.3% + FC 0.3%
Test 2	SAF 0.6%
Test 3	Nothing add

Appearance



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Application of "KEEP LONG"

Bread

Bulk density

Test method:

1) Pour tapioca pearl into a bowl until full

2) Measure the volume of full bowl of tapioca pearl

(Record = Vol.A)

3) Weight the bread

(Record = Weight of bread)

4) Pour tapioca pearl into that bowl

5) Measure the volume of tapioca pearl

(Record = Vol.B)

Calculation:

Bulk density (g/ml)

= Weight of bread/ Volume of bread

= Weight / (Vol.A – Vol.B)

	Weight (g)	Volume (ml)	Specific vol (ml/g)
Control	19.21	60	3.12
Test 1	15.43	50	3.24
Test 2	18.75	60	3.21
Test 3	15.40	50	3.25

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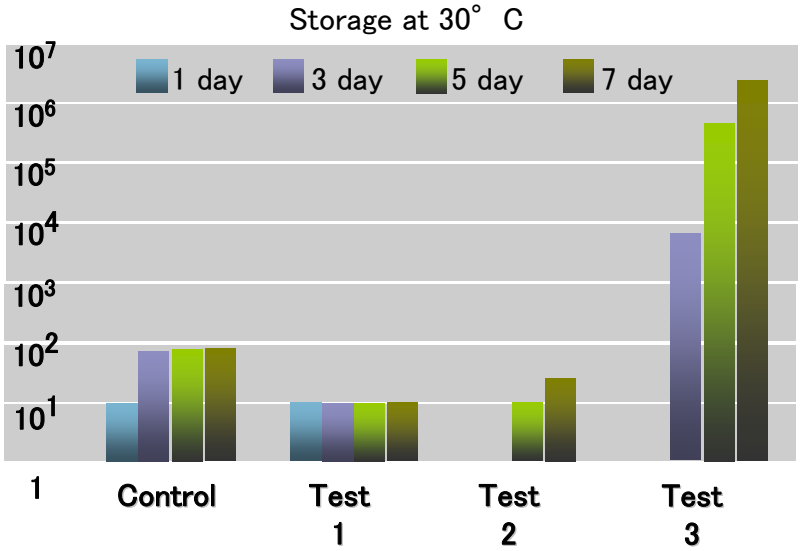
Application of “KEEP LONG”

Bread

Microbial test TPC (cfu/g)

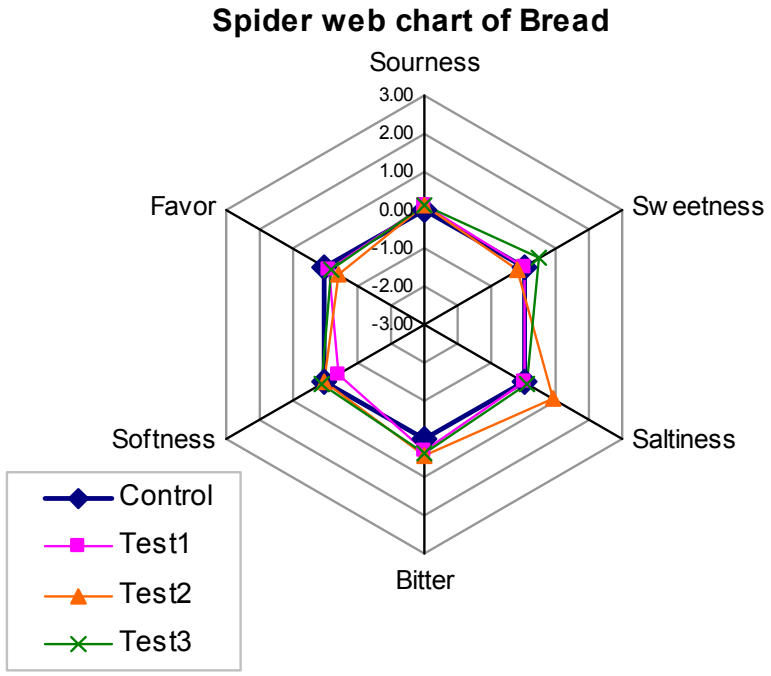


➢ **Mold:** Cont., Test1, 2 “ND”

Test3:

Control	Calcium propionate 0.3%
Test 1	Calcium propionate 0.3% + FC 0.3%
Test 2	SAF 0.6%
Test 3	Nothing add

Sensory test



➢ Preservation

(TCP:<10^5 & Mold: ND / 30℃ 7 days)

Control, Test 1 ,2 OK

➢Sensory

Control, Test 1, 2, 3 OK

Application of “KEEP LONG”

Butter cake

- ❖Performance enhancement of preservatives by KEEP LONG FC
- ❖Non preservative by KEEP LONG SAF

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Application of “KEEP LONG”

Butter cake

How to make

1. Shift cake flour and baking powder together
2. In low speed, beating butter and sugar together
3. Change to high speed and stir until it smoothness
4. Change to low speed: pour egg into cream mixture
5. Add flour, milk and vanilla and stir in cream
6. Bake at 350 F (˜177° C), 45–55 minutes

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Application of “KEEP LONG”

Butter cake

Test item

- **Food hygiene point**

  Heat resistance spore, Mold (2nd contamination)

- **Selection of “KEEP LONG”**

  Preservative + FC, SAF

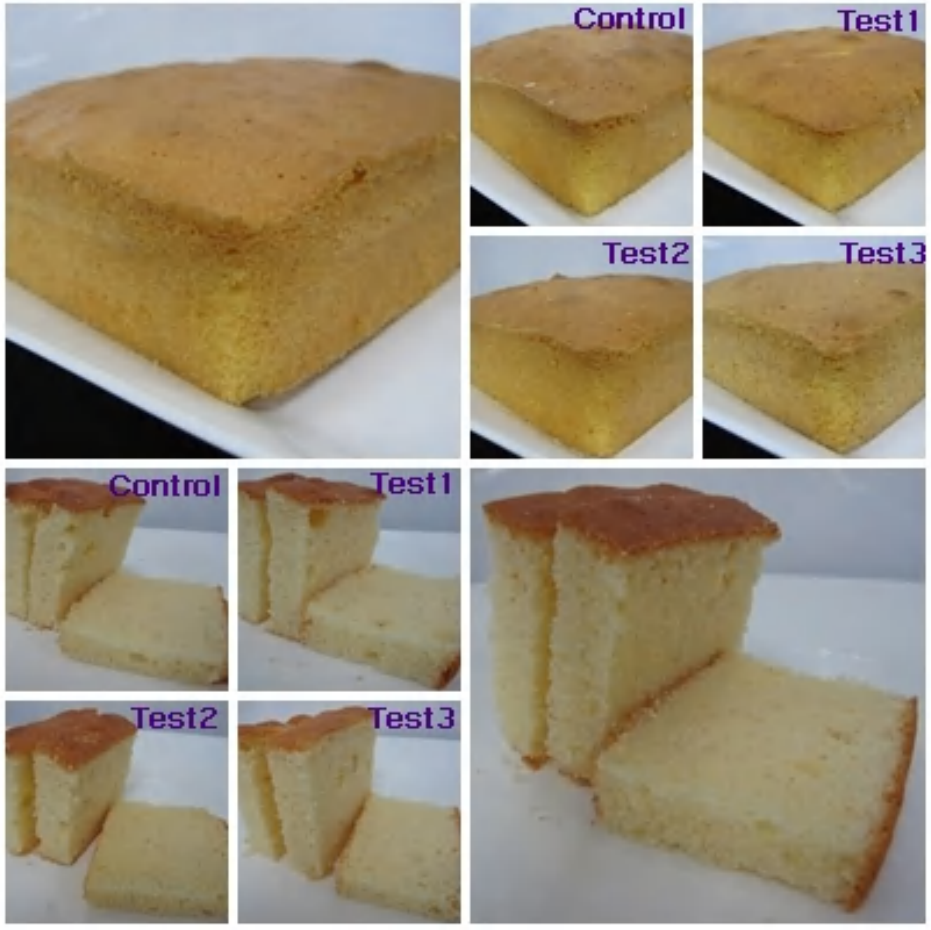
- **Analysis item**

  Bulk density

  Microbial test (TPC), Sensory test

Control	Sodium propionate 0.3%
Test 1	Sodium propionate 0.3% + FC 0.3%
Test 2	SAF 0.6%
Test 3	Nothing add

Appearance



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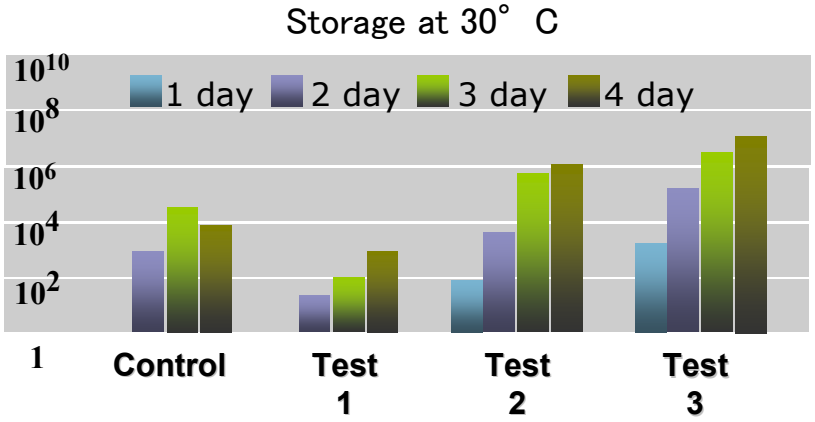
Application of "KEEP LONG"

Butter cake

Bulk density

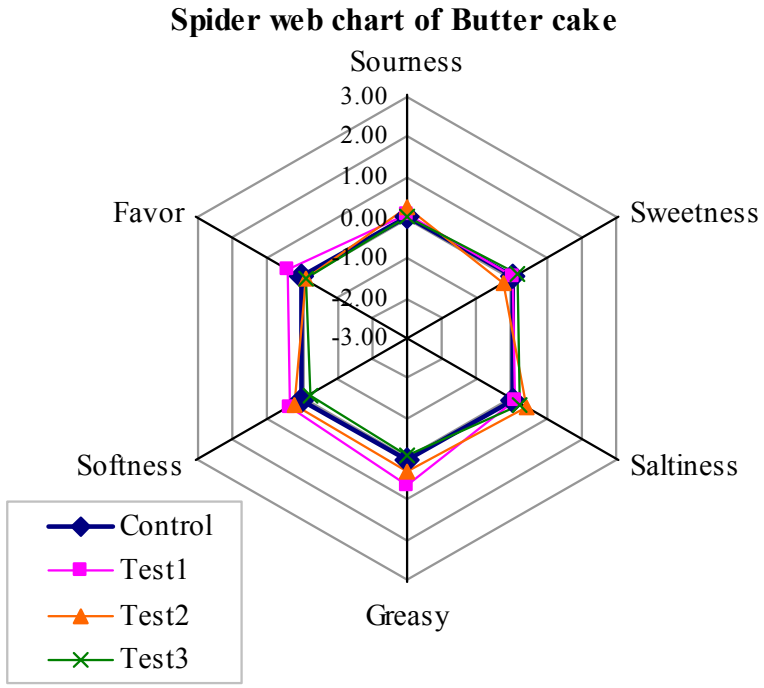
	Weight (g)	Volume (ml)	Specific vol (ml/g)
Control	21.46	45	2.10
Test 1	18.18	40	2.20
Test 2	11.31	25	2.21
Test 3	17.33	40	2.31

Microbial test TPC (cfu/g)



➢ **Mold:** All samples "ND"

Sensory test



➢ Preservation

(TCP:<10^5 & Mold: ND / 30℃ 7 days)

Control, Test 1 OK

➢ Sensory

Control, Test 1, 2, 3 OK

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Summary

pH Adjuster // KEEP LONG

- Applicable to wide range of food
- Non legal restrictions for the amount of addition

3 Lineup // KEEP LONG

- Can be selected for each food
- Available at each manufacturing process
- Not affect the quality of food by coating technology

Antibacterial performance // KEEP LONG

- Strongest combination of fumaric acid & sodium acetate
- Improving the performance of preservatives
- Bring out the antibacterial potential of food ingredients

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Thank You!

UENO FINE CHEMICALS INDUSTRY（THAILAND), LTD.

Head Office: 33/129 26th Fl., Wall Street Tower Bldg.,

Suramong Road, Bangkok 10500 Thailand

E-mail: **info@ueno-fc.co.th** Tel.: 02-266-2830, -237-6009