



Natural Moisturizer
AJIDEW[®] NL-50

Efficacy in Skin Care Applications

AJINOMOTO[®]
AJINOMOTO Co., Inc. AminoScience Laboratories

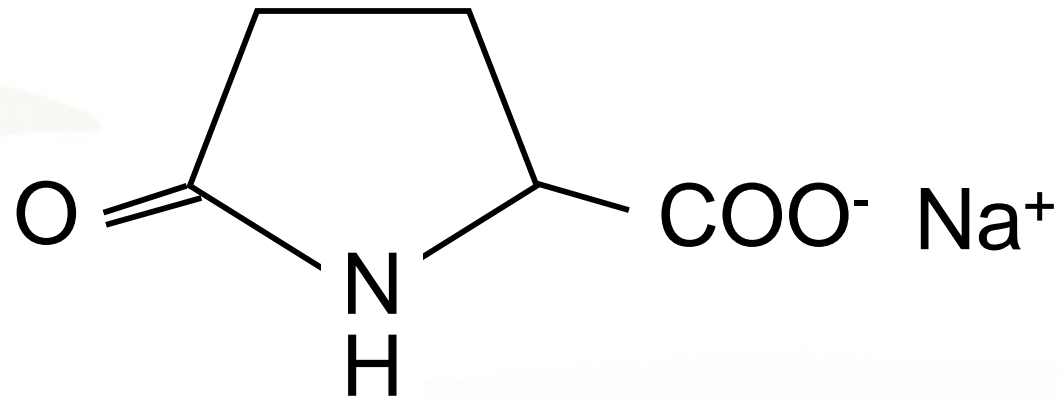
Introduction

- What is **AJIDEW**[®] NL-50
- NMF: Naturally Occurring Moisturizer
- Variation in Skin NMF Level

AJINOMOTO[®]

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AJIDEW® NL-50 (Sodium PCA)



- **AJIDEW®** NL-50 is sodium salt of Pyrrolidone Carboxylic Acid (PCA) .
- **Derived** from sodium salt of **L-Glutamic acid.**

Composition of NMF

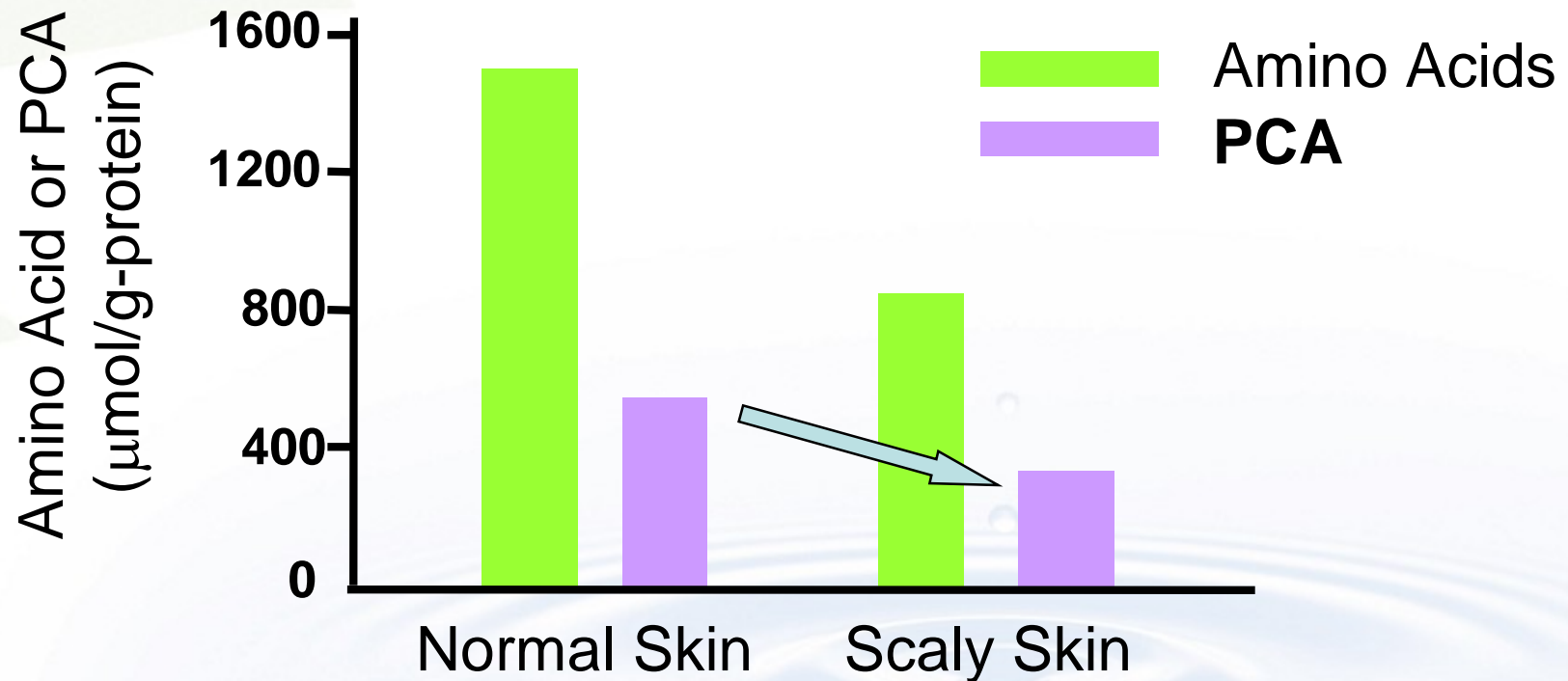
- PCA is one of the main components of Natural Moisturizing Factor.

Component	(%)
Amino Acids	40.0
<u>PCA</u>	<u>12.0</u>
Lactate	12.0
Urea	7.0
NH₃, Uric Acid, Glucosamine, Creatinine, Citrate	1.5
Inorganic salts	18.5
Sugar, Organic Acids, Peptides, Undefined	8.5

(H.W.Spier and G.Pascher, Arch.f.Dermat., **199**, 411-427(1955))

Essential for Skin Health

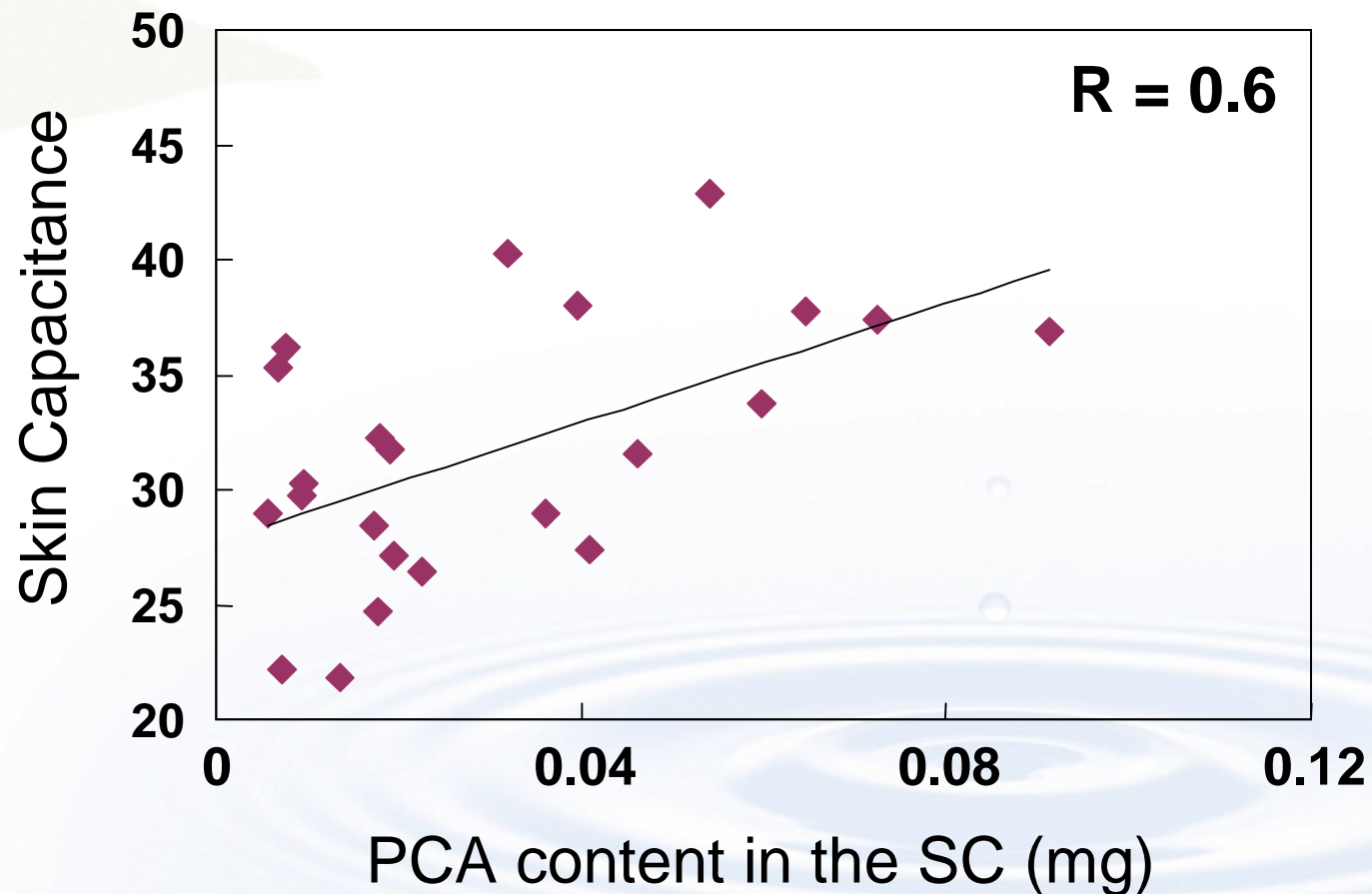
- Amount of PCA in scaly skin is lower than that in normal skin.



(Horii, SCCJ, 14, 2, 172 (1980))

Correlation between PCA and Skin Capacitance

- There is a positive correlation between PCA content in the SC and skin moisture.

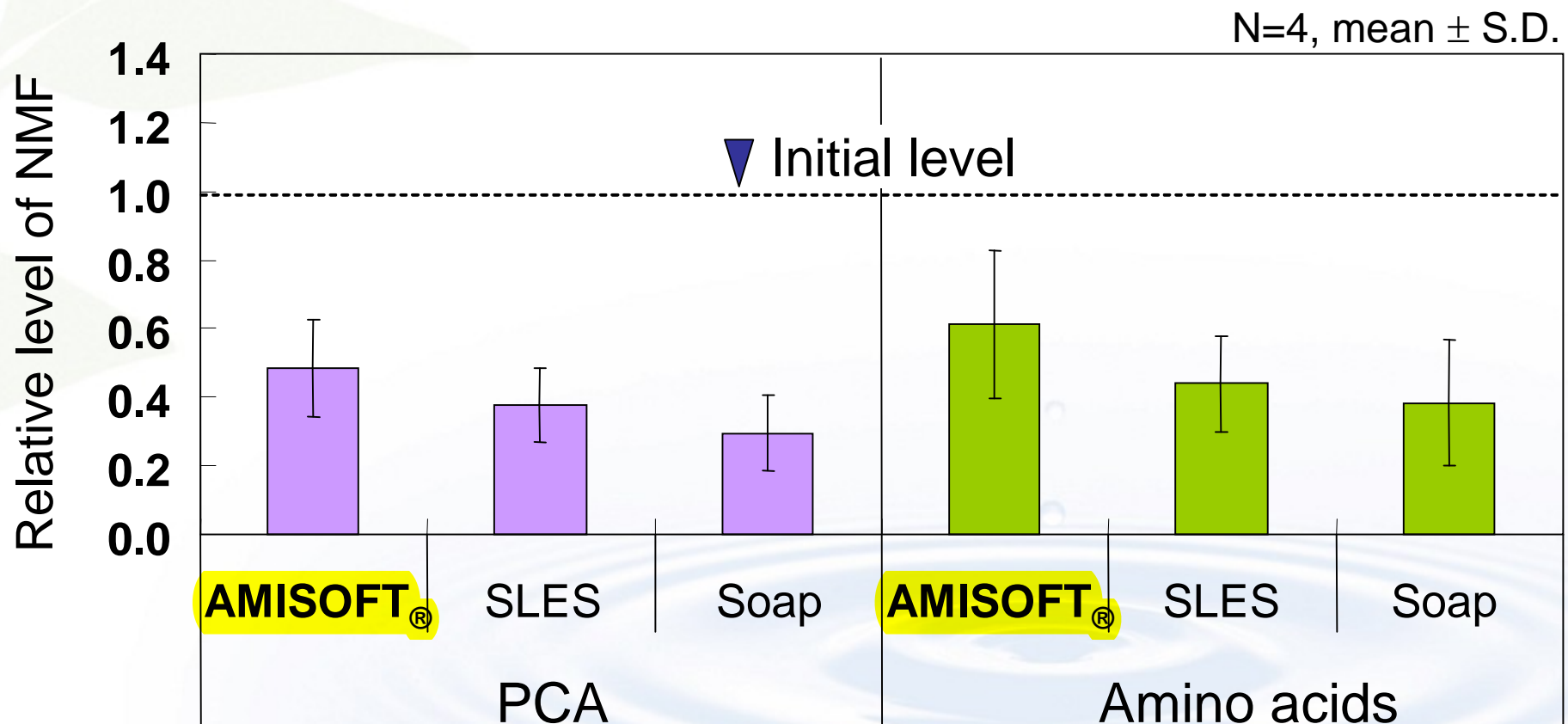


Purposes of Skin Care

- To **clean** the skin
 - To **preserve** the skin's moisture balance
 - To **stimulate** skin metabolism
 - To **protect the skin** from harmful ultraviolet radiation
- ➔
- **Rinse off** product
(Bar soap, shower gel)
- ↓
- Undesired side effects :**
Valuable components are also washed off !
- **Leave on** product
(Lotion, cream)
-
- ```
graph TD; A[To clean the skin] --> B[Rinse off product (Bar soap, shower gel)]; B --> C[Undesired side effects: Valuable components are also washed off!]; C --> D[Leave on product (Lotion, cream)]; E[To preserve the skin's moisture balance] --- F[Leave on product (Lotion, cream)]; G[To stimulate skin metabolism] --- F; H[To protect the skin from harmful ultraviolet radiation] --- F;
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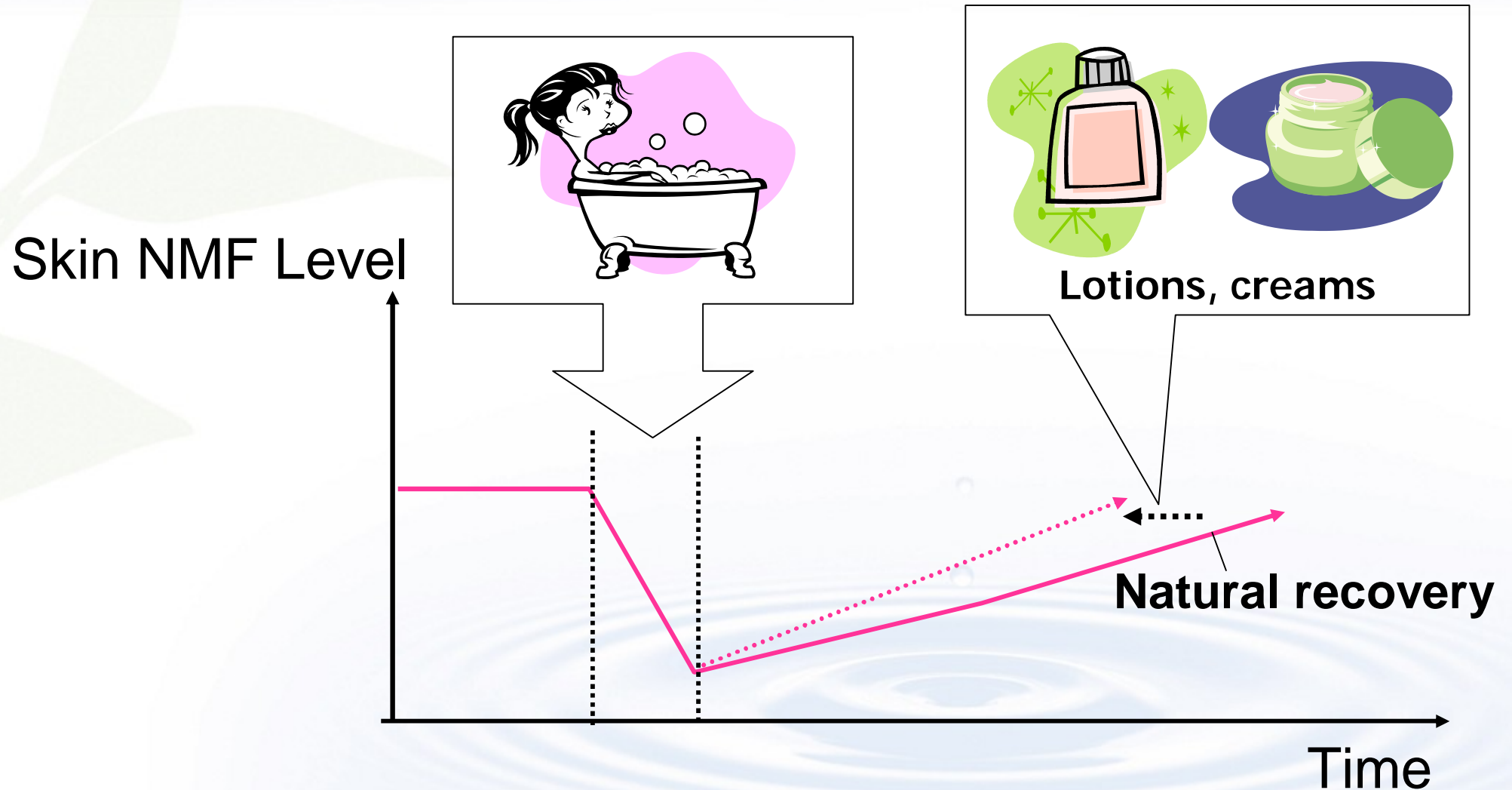
## NMF Decrease by Cleansing

- PCA and amino acids in the skin are washed off by cleansing with surfactants.



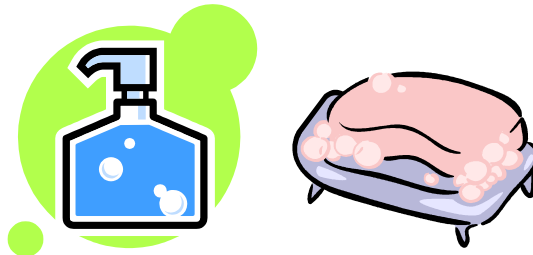


# Skin NMF Level is Varying !



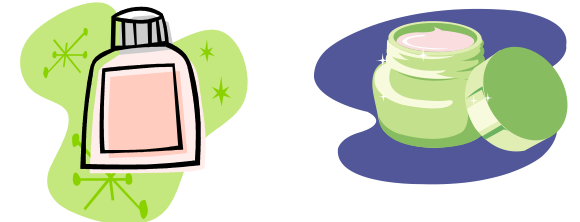
# Recommended Application of **AJIDEW**®

## Cleansing products



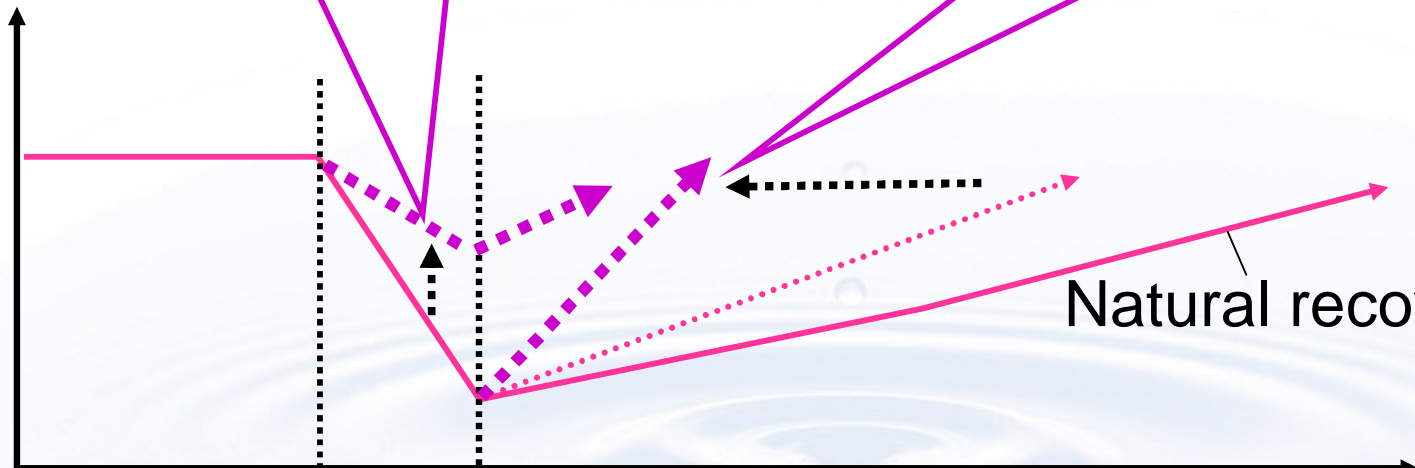
+AJIDEW® NL-50

## Lotions, creams



+ AJIDEW® NL-50

Skin NMF Level



Natural recovery

Time

# Efficacy in Skin Care Applications

## Part 1: Rinse off Products

### 1. Rinse off products + **AJIDEW**<sup>®</sup> NL-50

-Inhibition of PCA Loss

-Skin moisture

-Sensory test

### 2. Leave on product + **AJIDEW**<sup>®</sup> NL-50

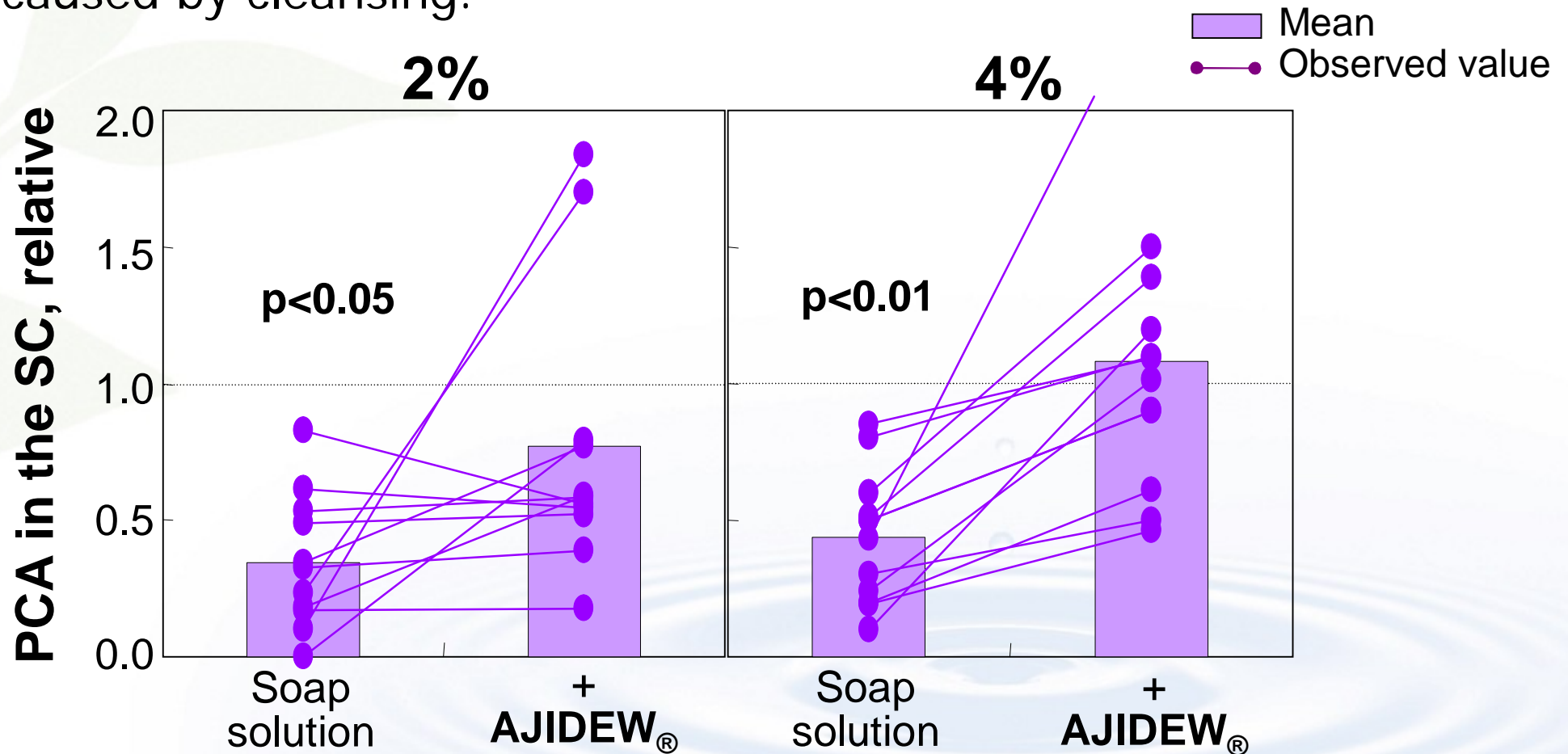
-Absorption of PCA to the skin

-Skin moisture

-Sensory test

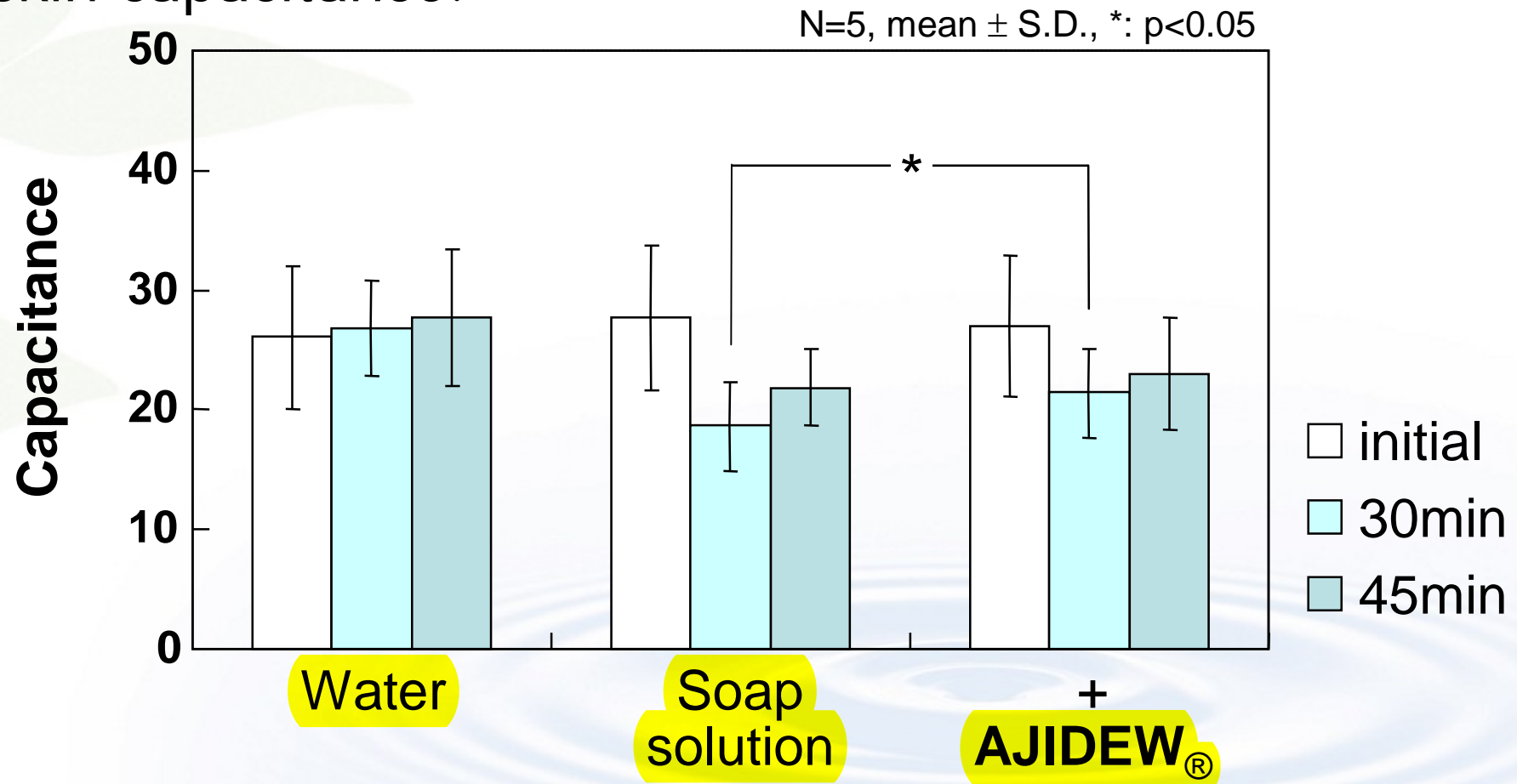
# Inhibition of PCA Loss

- A soap incorporating **AJIDEW**® NL-50 prevents the loss of skin PCA caused by cleansing.



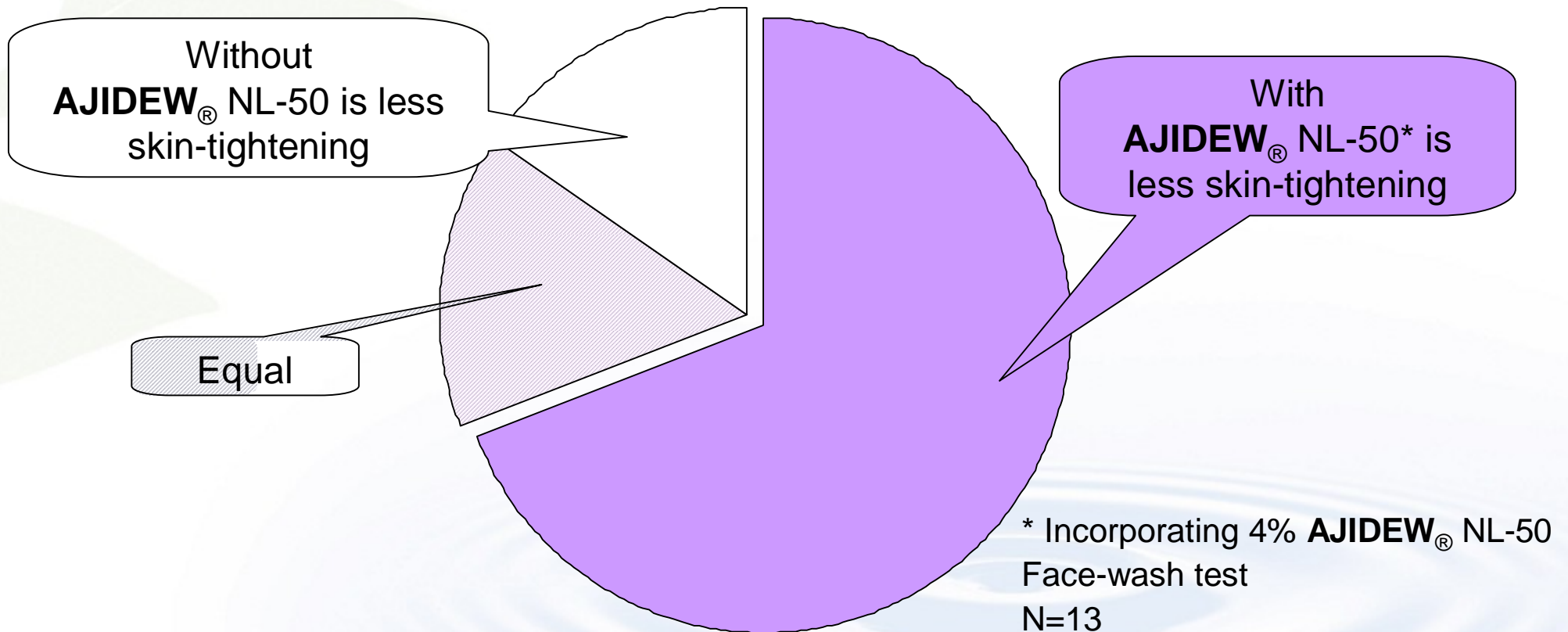
# Skin Moisturization before and after Cleansing

- A soap incorporating **AJIDEW**® NL-50 maintains the skin capacitance.



# Sensory Test

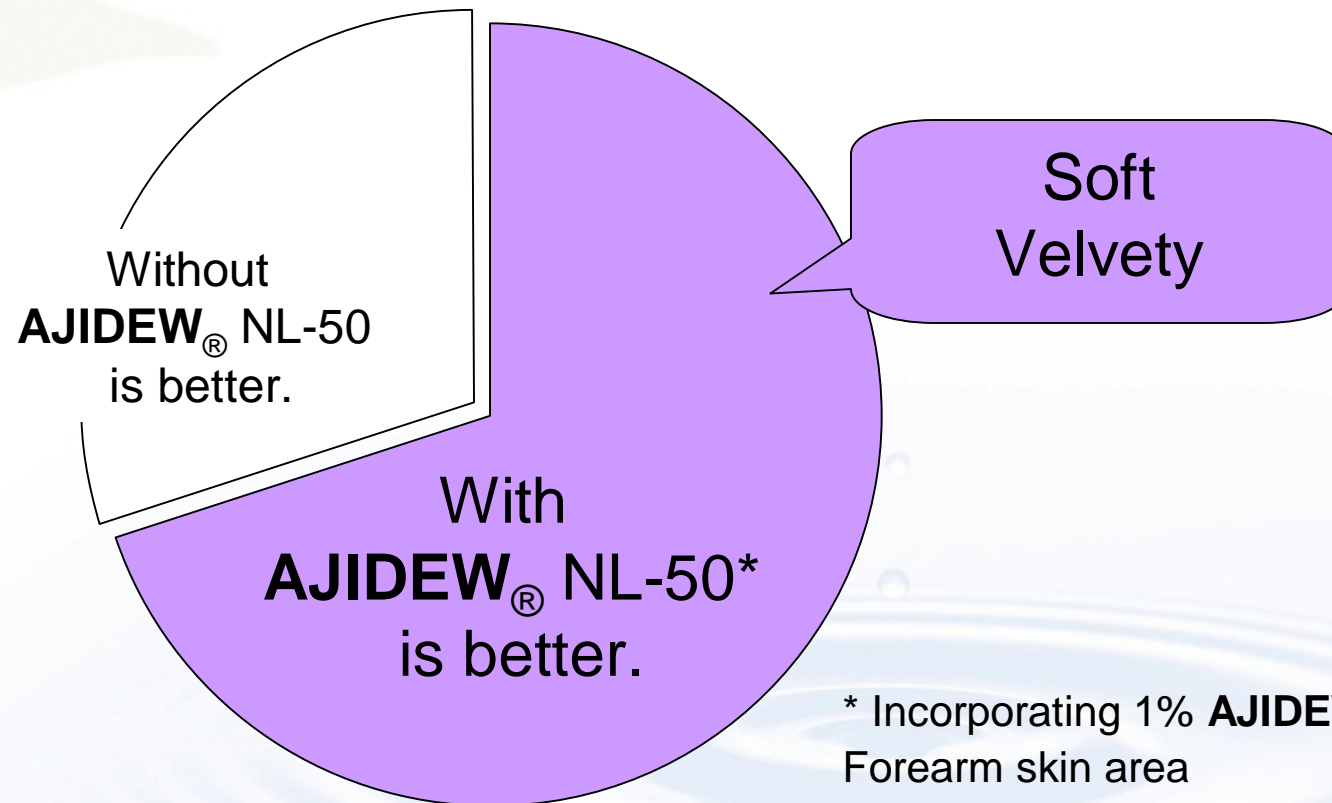
- **AJIDEW<sup>®</sup> NL-50** reduces skin tightness caused by a soap-base cleansing formula.



# Sensory Test

~ Addition to a SLES-base System

- **AJIDEW<sup>®</sup> NL-50** improves skin softness and velvety skin-feel in a SLES-base formula.



\* Incorporating 1% **AJIDEW<sup>®</sup>** NL-50  
Forearm skin area  
N=30

# Efficacy in Skin Care Applications

## Conclusion of Part 1: Rinse off Products

- PCA and amino acids in the skin were washed off by cleansing with surfactants.
- A soap containing **AJIDEW**<sup>®</sup> NL-50 prevent the loss of both PCA contents and moisture in the skin by cleansing.
- Addition of **AJIDEW**<sup>®</sup> NL-50 to surfactant systems, soap and SLES system, improves sensory evaluation.



# Efficacy in Skin Care Applications

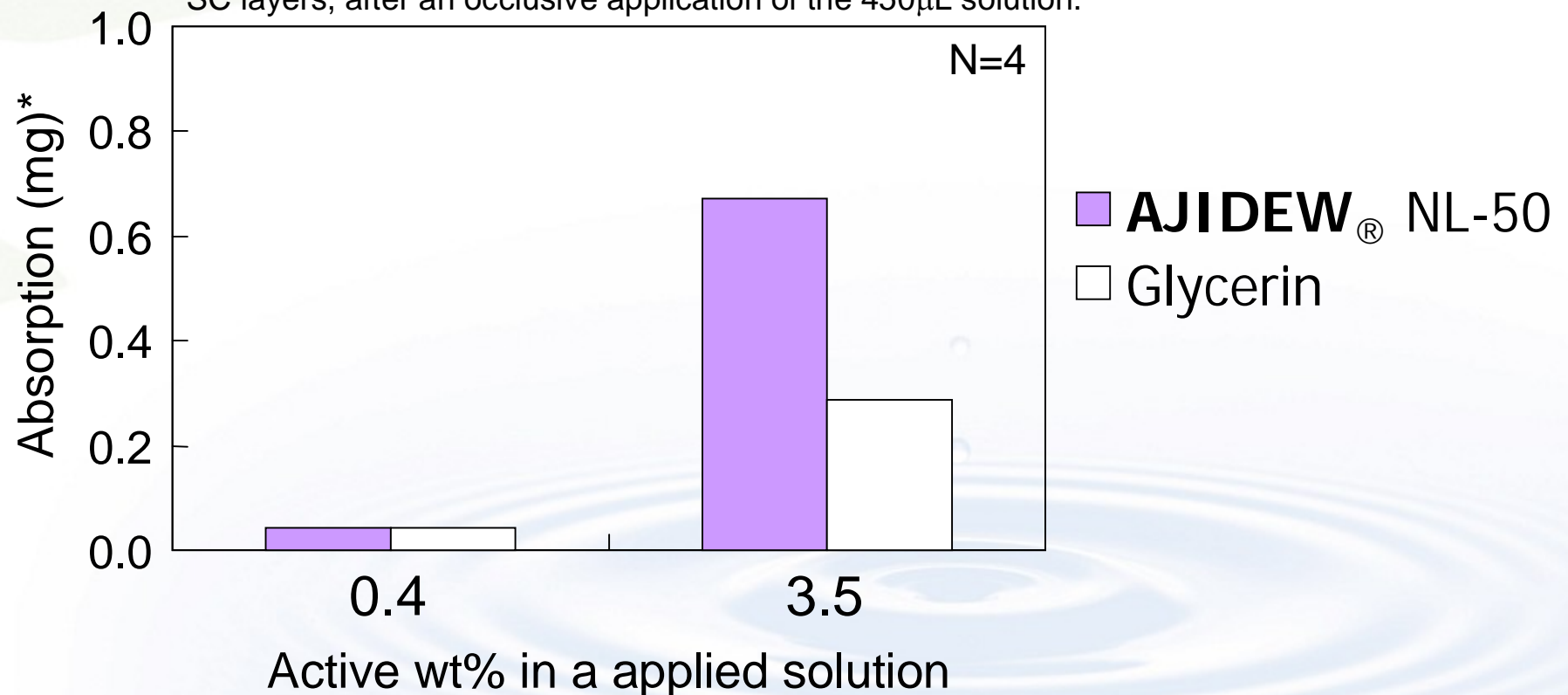
## Part 2: Leave on Products

1. Rinse off products + **AJIDEW**<sup>®</sup> NL-50
  - Inhibition of PCA Loss
  - Skin moisture
  - Sensory test
2. Leave on product + **AJIDEW**<sup>®</sup> NL-50
  - Absorption of PCA to the skin
  - Skin moisture
  - Sensory test

# Absorption of PCA to the Skin

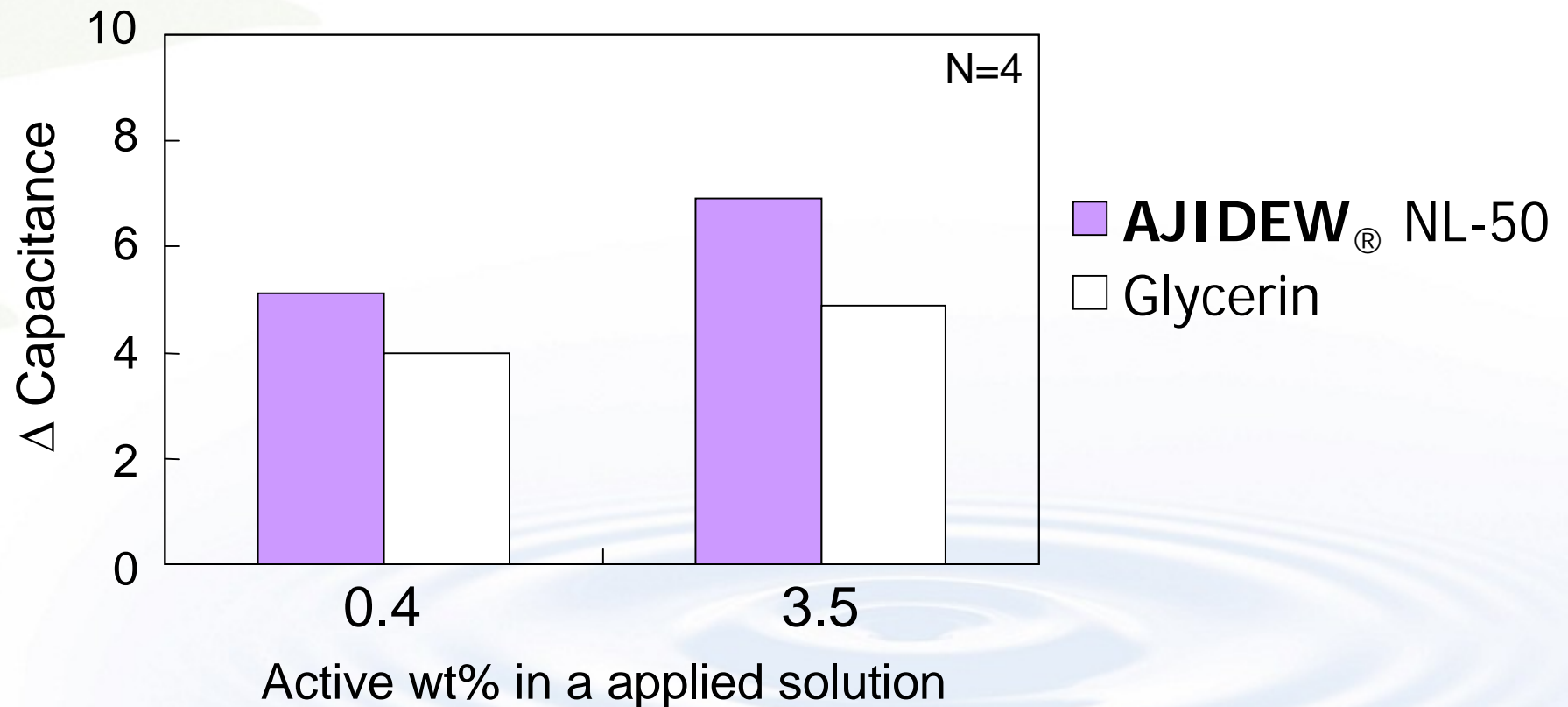
- PCA is absorbed into the skin when **AJIDEW® NL-50** is applied.

\*Absorption per 5cm-square forearm skin area, sum of the 5 stripped SC layers, after an occlusive application of the 450 $\mu$ L solution.



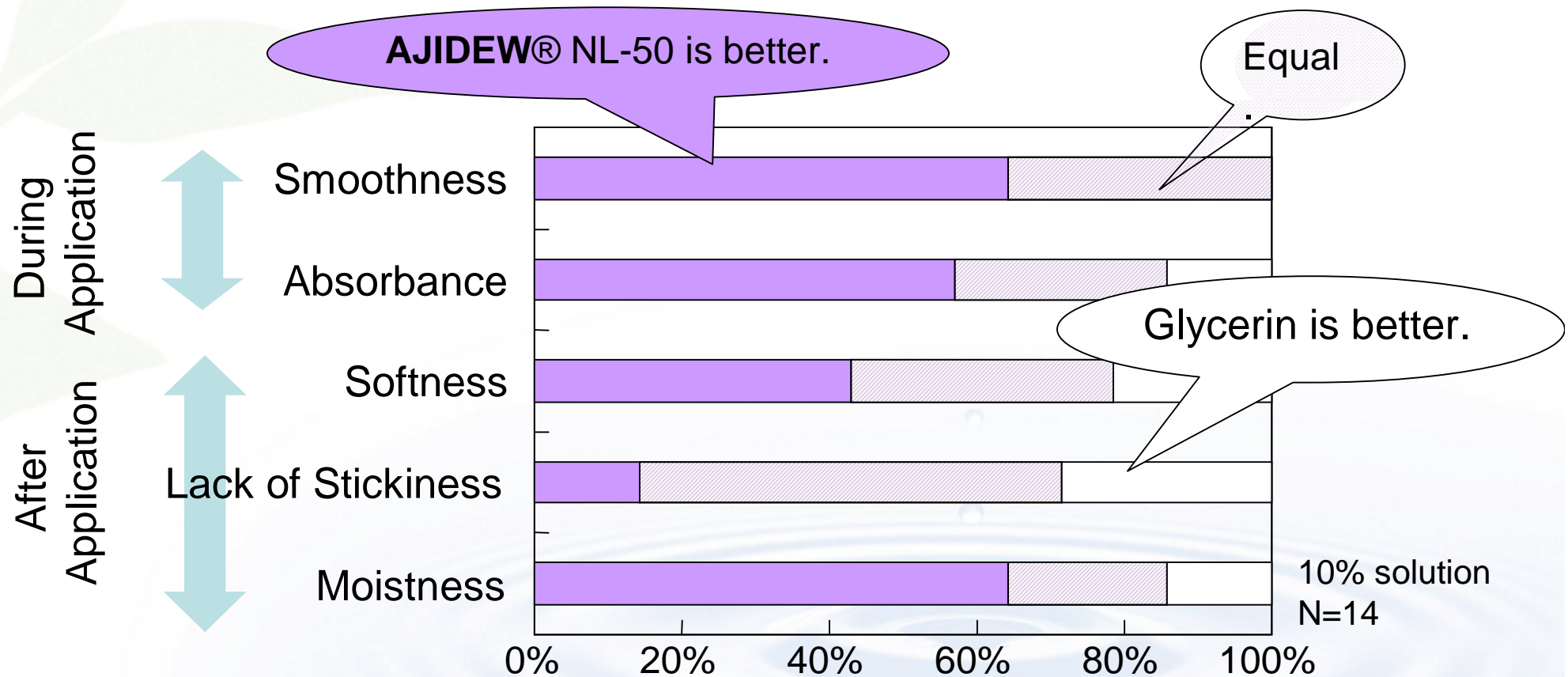
# Skin Moisture Measurement

- **AJIDEW**® NL-50 provides skin moisturization.



# Sensory Test

- Smoothness during application, absorbance and moisturized skin feel of **AJIDEW**® NL-50 are appreciated in comparison with glycerin.



# Efficacy in Skin Care Applications

## Conclusion of Part 2: Leave on Products

- Application of **AJIDEW**<sup>®</sup> NL-50 solution increases PCA content in the skin and provides skin moisturizing effects.
- **AJIDEW**<sup>®</sup> NL-50 provides better skin feel compared with glycerin.

# Recommend Applications

- Rinse-off

- Bar soaps
- Facial washes
- Shower gels, bath bubbles
- Hair shampoos
- Hair conditioners
- Waving lotions

0.5-5%

- Leave-on

- Skin care lotions, creams, essences
- Topical care items i.e. eye creams, serums, ...
- Hair masks, hair essences

0.2-2%

# Summary

- There is a positive correlation between PCA content in the skin and skin moisture.
- Cleansing with surfactants causes decrease of PCA in the skin.
- **AJIDEW**<sup>®</sup> NL-50 prevents loss of PCA in the skin and skin moisture.
- **AJIDEW**<sup>®</sup> NL-50 is absorbed to the skin and provides skin moisturization.
- **AJIDEW**<sup>®</sup> NL-50 improves skin feel.