

The background features a soft-focus image of green leaves on the left and right sides. In the center, there are concentric blue and white ripples on a light blue surface, suggesting a water droplet. The overall color palette is light and fresh, with greens and blues.

Prodew 400

**Amino Acid Based Humectant
for Skin Care**

AJINOMOTO®

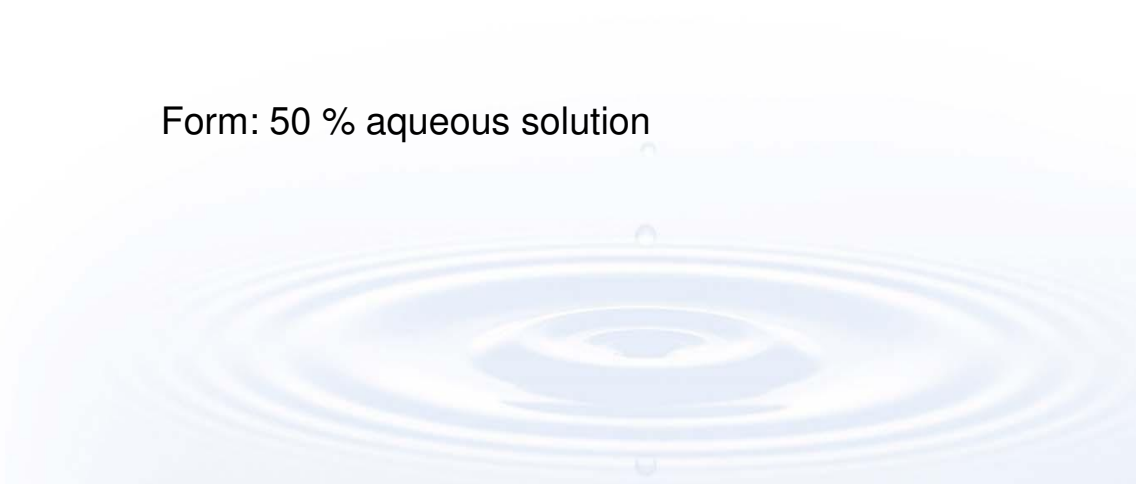
The logo for Ajinomoto, featuring the brand name in a red, serif font.

Characteristics of Prode^w 400

Prode^w 400 is a highly effective moisturizer formulated
With 8 amino acids.

The composition of amino acids is modeled after NMF

Form: 50 % aqueous solution

A background image showing a close-up of water ripples on a light blue surface, with a single drop of water falling into the center, creating concentric circles.

What are **Amino Acids** ?

Amino acids are substances having both
an **amino group (-NH₂)**
and a **carboxyl group (-COOH)** .

Amino Acids are the smallest units of protein.

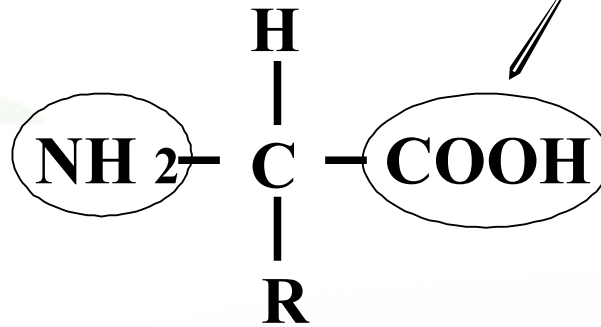
Our body protein consists of 20 kinds of **Amino Acids**.



Structure of Amino Acid

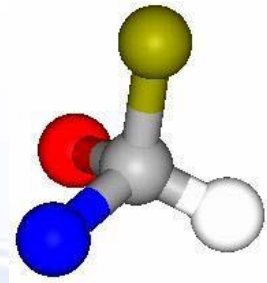
Amino group
(base)

Carboxyl group (acid)



R=H
R=CH₃
R=CH₂OH
R=(CH₂)₂COOH

Glycine
Alanine
Serine
Glutamic Acid



Our body protein consists of 20 kinds of **Amino Acids**.

The logo for Ajinomoto, featuring the brand name in a red, serif font with a registered trademark symbol.The background of the slide is a light blue and white gradient. On the left side, there are several green leaves of varying sizes, some overlapping. In the lower right quadrant, there is a close-up image of a water droplet falling into a pool of water, creating concentric ripples. The overall aesthetic is clean and fresh.

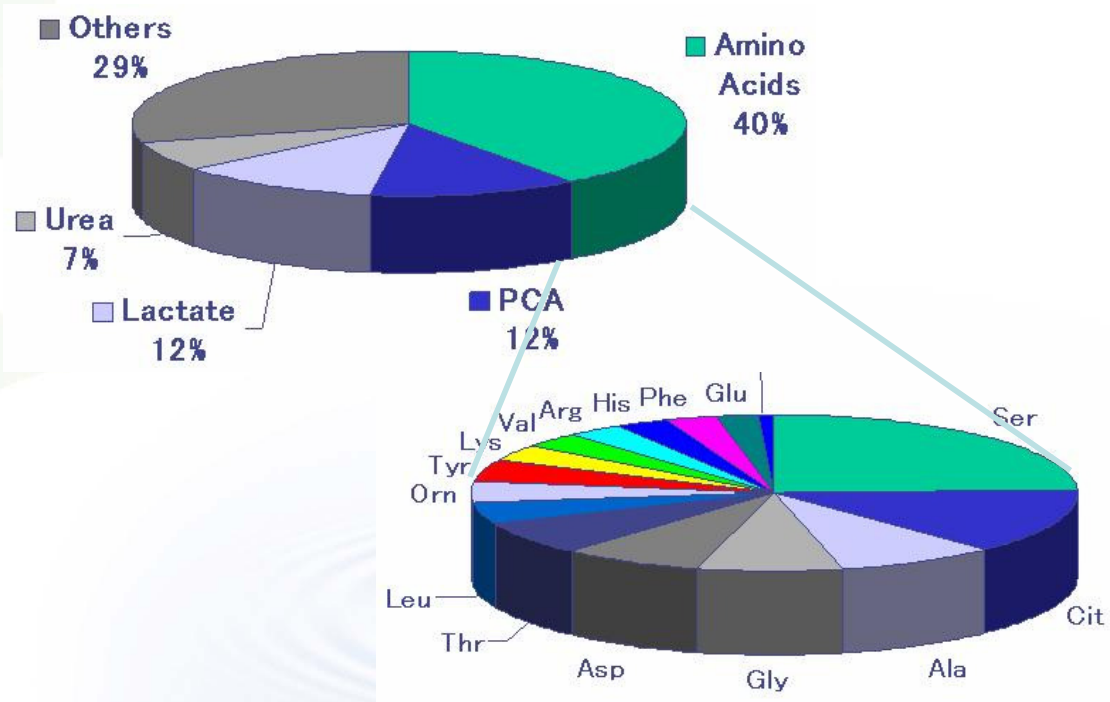
Amino acids and skin

Composition of NMF

Amino acids	40%
PCA (pyrrolidone carboxylic acid)	12%
Lactates	12%
Urea	7%
NH₃, uric acid, glucosamine, creatinine	1.5%
Citrates	0.5%
Na 5%, K 4%, Ca 1.5%, Mg 1.5%, PO₄ 0.5% Cl 6%	18.5%
Sucrose, organic acids, peptides, other materials	8.5%

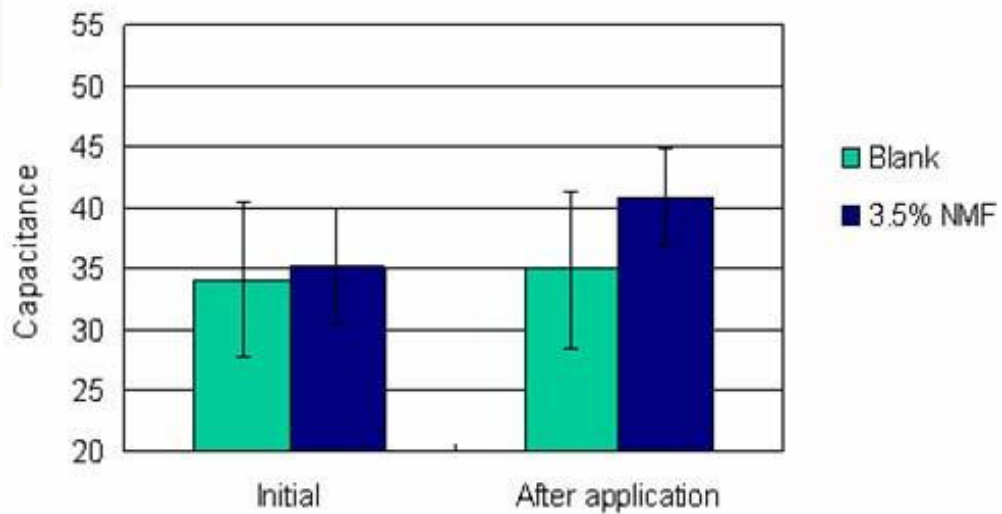
((H. W. Spier, G. Pascher, *Hautarzt* , 7, 2, (1956))

NMF and Amino acid composition



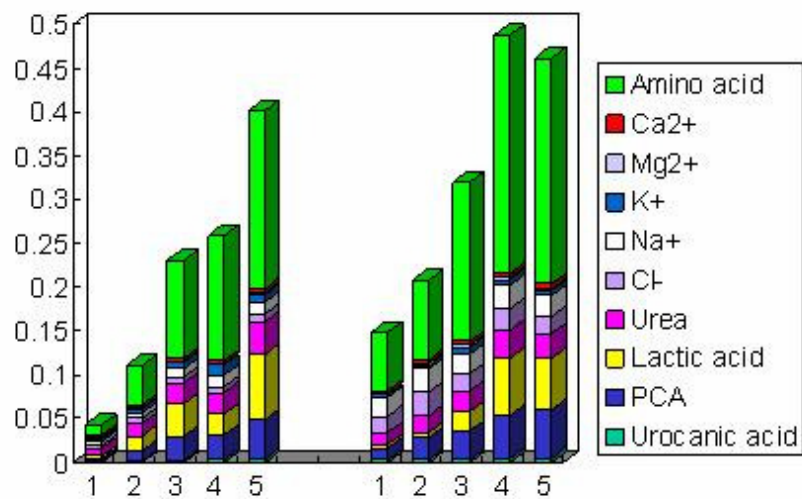
[H.W.Spier, G.Pascher, Der Hautarzt, Vol.7, 55-60 (1956)]

Moisturized skin by application of model NMF



Permeability of NMF

NMF in the stratum corneum is increased by occlusive application of model NMF solution



*4) *BIO INDUSTRY* 22(9):31-37 (2005)

<Model NMF>

	(wt%)		(wt%)
Amino acid	1.55	Ser	0.51
PCA	0.41	Cit	0.20
Urocanic acid	0.06	Ala	0.12
Lactic acid	0.52	Thr	0.10
Urea	0.27	Orn	0.06
NaCl	0.72	Asp	0.06
NaOH	pH 5.5	Gly	0.06
water	balance	Leu	0.06
total	100.00	Val	0.06
		His	0.06
		Arg	0.06
		Lys	0.06
		Phe	0.06
		Tyr	0.06
		Glu	0.02
		total	1.55

<Procedure>

Model NMF : 3.5 wt% *1)

Application : Occlusive patch (forearm), 3cmx3cm, 1 hour.

Subjects : 6 subjects X 2 areas = Blank 6 areas vs . Application 6 areas

Measurement : HPLC, HPCE *2) and so on.

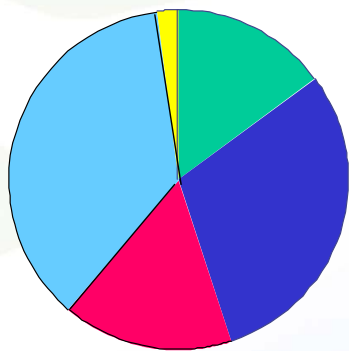
* Insoluble protein was determined by Lowry method and NMF per insoluble protein was calculated.

Katsura Shimizu, *Fragrance Journal* , No.56, 19-25 (1982)

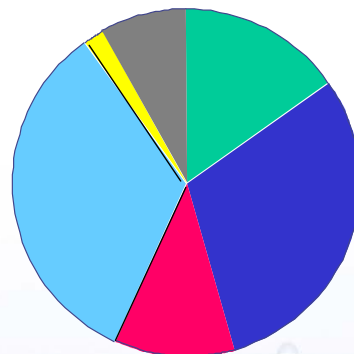
High Performance Capillary Electrophoresis

Technical data 3000-0570E

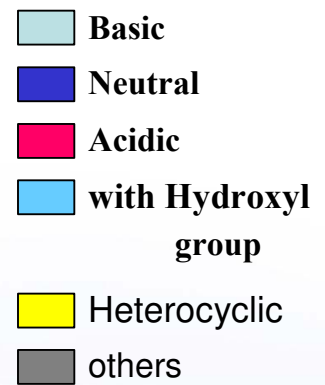
Amino Acid Composition of **ProdeW 400** is Modeled After NMF



Amino acids
in **PRODEW 400**



Amino Acids
in human skin collagen



Composition of PRODEW 400

Humectant	PCA-Na Sorbitol Trimethylglycine
Neutral amino acid	Glycine L-Alanine
Heterocyclic amino acid	L-Proline
Amino acid with hydroxyl group	L-Serine L-Threonine
Basic amino acid	L-Arginine L-Lysine
Acidic amino acid	L-Glutamic acid
Others	Preservative Water

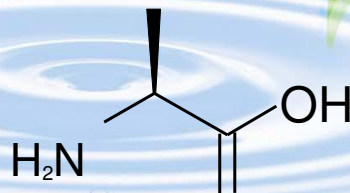
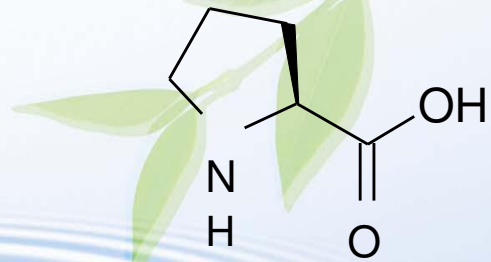
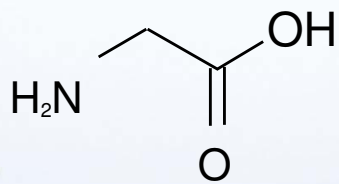
8 kinds of
amino
acids

The Ajinomoto logo is located in the top right corner of the slide. It consists of the word "AJINOMOTO" in a red, serif font, with a registered trademark symbol (®) to its upper right. The background of the slide is a light blue gradient with a faint image of a water droplet creating ripples and some green leaves on the left side.

AJINOMOTO®

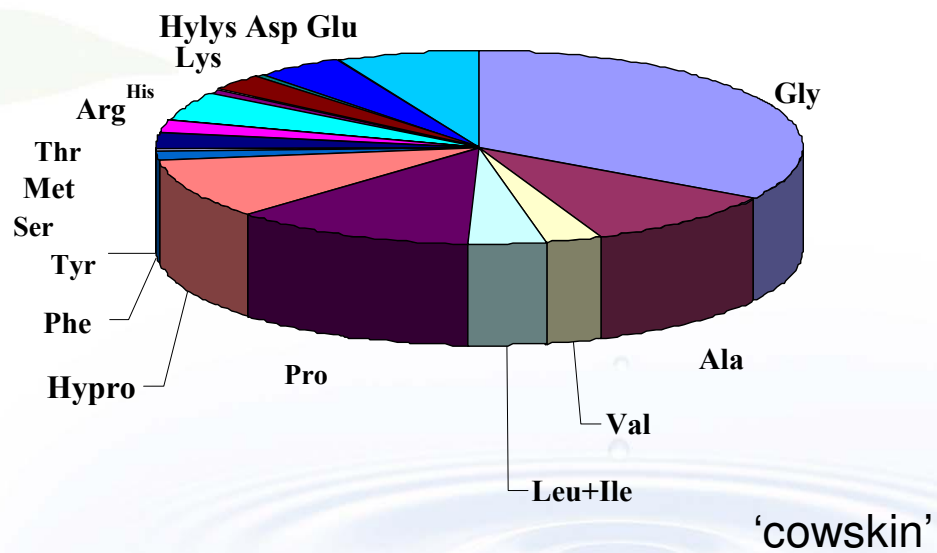
Efficacy of Each Component in PRODEW 400

Glycine (Gly), Alanine (Ala), & Proline (Pro)



AJINOMOTO®

Glycine and Alanine are main Amino Acids of Human Skin Collagen



Encyclopedia Chimica, Kyoritsu shuppan Co., Ltd., P707 (1997)

Synthesis of collagen is promoted by addition of amino acids.

Promotion of collagen synthesis is promoted by the balanced addition of amino acids similar to collagen amino acid composition.

G: Glycine, P: Proline, A: Alanine = 3 : 2 : 1

(M. Yoshida et al., 1994)

A decorative graphic of three green leaves on the left side of the slide.

Anti-oxidative Activity of Amino Acids

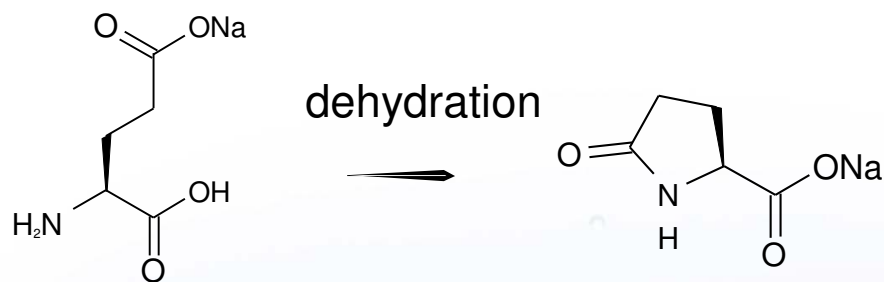
Content of hydro peroxide in Ethyl linoleate was measured.
Amino Acids showed anti-oxidative activity.
Among amino acids, Glycine and Alanine have high activity.

A decorative graphic of water ripples in the bottom center of the slide.

(Shiseido, Kumano, 1988)

Sodium PCA (AJIDEW N-50)

L-PCA is the most abundant component in NMF

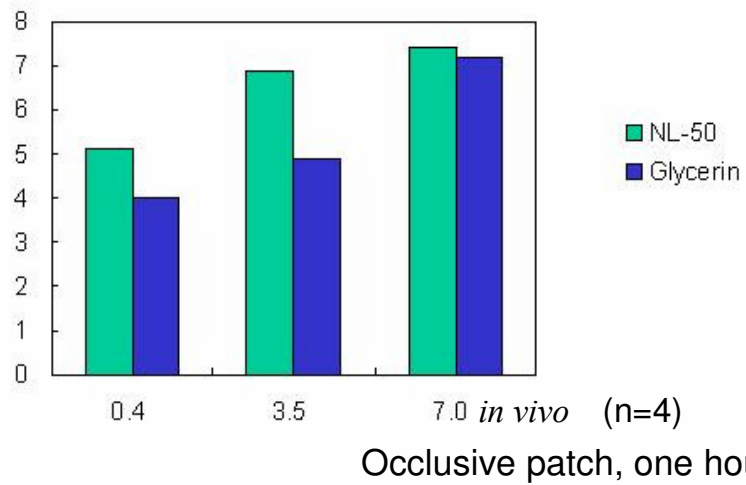


Sodium L-Glutamate
("AJINOMOTO")

Sodium PCA
(AJIDEW N-50)

Moisturizing Effect of Sodium PCA

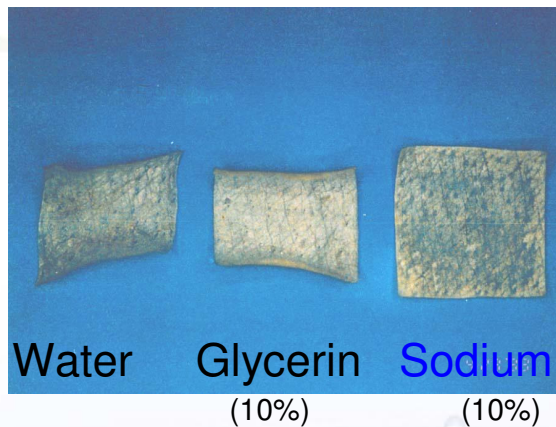
Skin Capacitance Measurement / Occlusive Patch



AJINOMOTO.

Moisturizing Effect of Sodium PCA

Sodium PCA prevents the shrinkage of the dry pig skin.



Water

Glycerin

Sodium PCA

(10%)

(10%)

<Procedure>

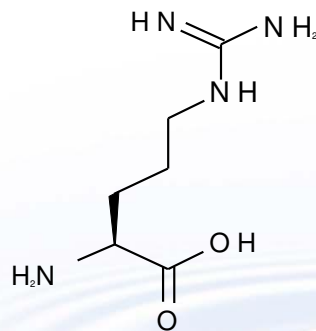
A sheet of pig skin (20X20mm) dipped in 10% aqueous solution of a humectant for 2 hours was dried for 2.5 hours under 40% RH/ 25 °C

Arginine (Arg)

Important amino acid for human body

- Essential in Growth Hormone Production
- Produce NO acts in human body as a vasodilator and neural transmitter substance

Medical application Hepatic, Fatigue Recovery, Vasodilator etc.,
Personal Care Application Hair Conditioning, Neutralizer, etc.,



$pK_{COOH}=2.18$, $pK_{NH_3}=9.09$, $pK_{Guan}=13.2$, $pI=11.15$

L-Arginine for skin care

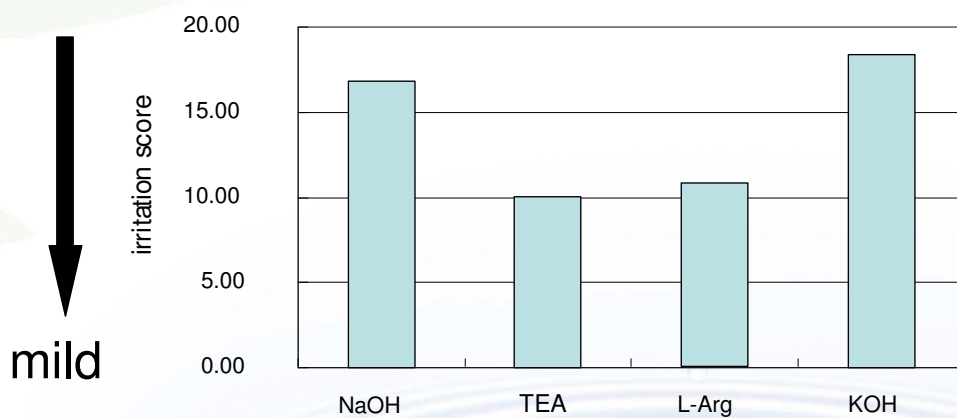
- Skin condition is recovered by application of Glycine and L-Arginine
Kawada *et. al.* , (1997)
- L-Arginine replenishes cells and valuable to recover skin damage.
- Oral intake of Arginine improves collagen synthesis of wounded skin (Human study)

A.Babul et.al., *Surgey* 108, 331-337(1990)

Result of HET-CAM Test

The score of **Arginine** is smaller than that of NaOH and KOH, and is equal to that of TEA.

Concentration: 1 mol/L



mild

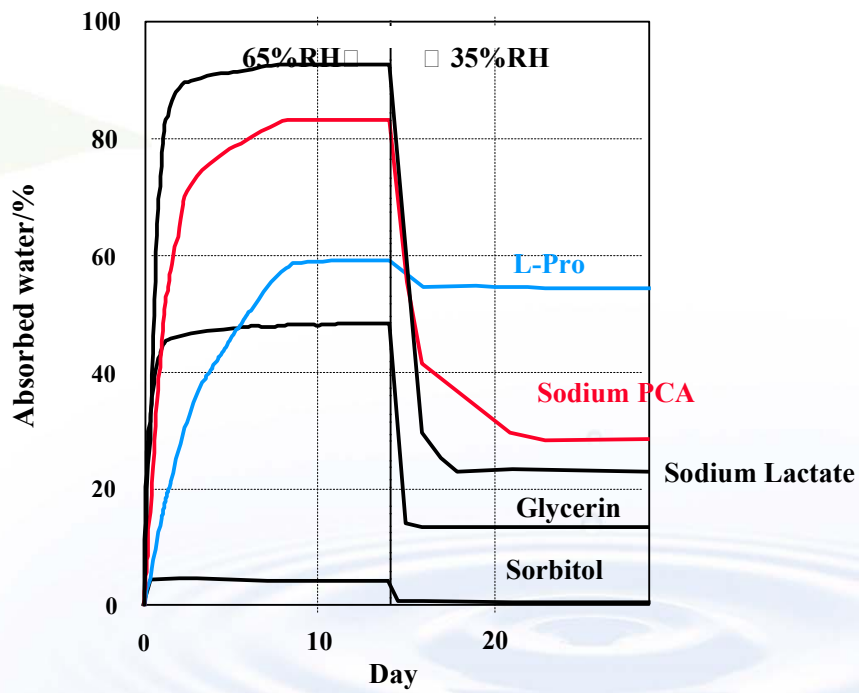
(n=6)

An in vitro irritation score (IS) for the conjunctiva injury were calculated with a formula, which combines the times registered from hemorrhage, lysis and intravascular coagulation.

L-Proline for skin care

- Pro is contained abundantly in skin collagen
- Pro promote synthesis of collagen
- Pro shows novel moisturizing ability among amino acids
- Pro synergistically increase the moisturizing effect in the presence of Leucine and Iso-Leucine

Moisture absorbing and retaining properties of humectants.




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Characteristics of

Prodew 400

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With 8 amino acids.
The composition of amino acids is modeled after NMF

A decorative graphic at the bottom of the slide showing a water droplet falling into a pool of water, creating concentric ripples.