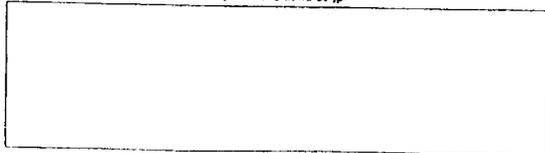
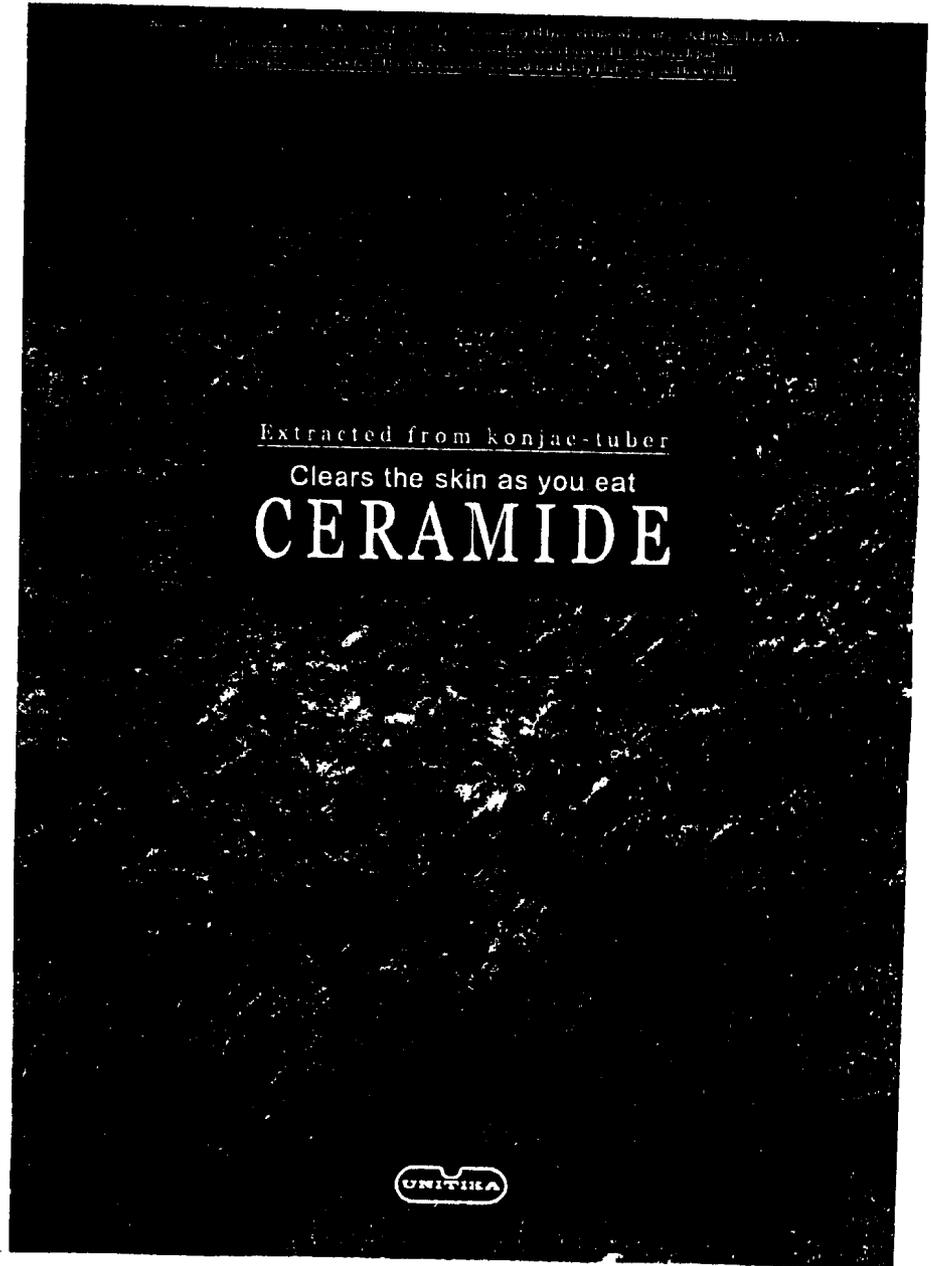


UNITIKA LTD.

UNITIKA LTD. Health & Amenity Business Dept.
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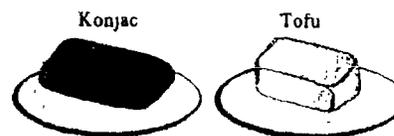
Extracted from konjac-tuber
Clears the skin as you eat
CERAMIDE



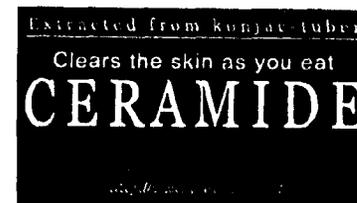
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Phyto-Ceramide extracted from konjac-tuber

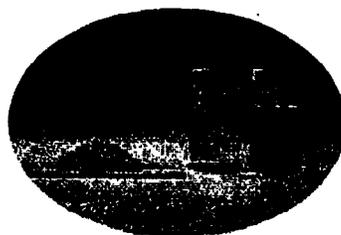
Completely safe edible ceramide



Konjac is a traditional Japanese food as healthful as tofu. It is a diet food popular for its low cost and high degree of safety.

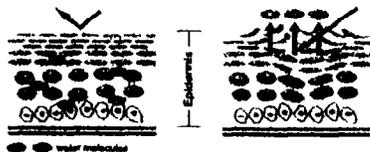


Ceramide preserves the moisture in the skin. Skin loses softness when it dries out. The substance also controls melanin pigments. Unilka has been doing research into plant-derived ceramide for several years to find a lower cost source, finally coming upon Konjac-tuber, a plant that has been part of the Japanese diet for centuries. Konjac-tuber contains as much as 7-15 times more ceramide than other plants. Unilka has succeeded in developing a technique to efficiently extract ceramide, making it possible to offer the substance at a significantly lower cost. Safety has been established in scientific tests. Applications vary from cosmetics to beauty-related health foods, and can be made into tablets, snacks or beauty drinks. It's an edible ceramide. Other possible applications include clothing material and bath agents.



Ceramide

Ceramides are main components of intracellular lipids in human skin layers, especially in stratum corneum (horny layer) and stratum granulosum (granular layer), both of which include ceramide at 40-50%. Ceramides inhibit evaporation and loss of water by constructing hydrogen bond networks with water molecules. Therefore, ceramides play an important role taking charge of barrier functions of stratum corneum. Quite a few studies have shown that ceramides decrease with aging, and remarkably decrease in skin suffering dryness, roughness, atopic dermatitis (AD), and senile keratosis.



The composition of intracellular lipids in stratum corneum

The characteristics and advantages of "Phyto-Ceramide"

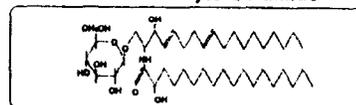
"Phyto-Ceramide," which is an extract from Konjac (*Amorphophallus konjac* K. Koch), is an edible beauty-care product richly containing Glucosylceramide, s'Glycosphingolipid.

Being natural products from Konjac, "Phyto-Ceramide" is a highly safe food, and continuous intake will gain high performance.

As Phyto-Ceramide take on varied appearances, its usage is suitable to any kind of food.

References:
 Shiohara T. et al. *J. of Nutrition*, 124 (5): 702 (1994)
 Morita A. K. et al. *PAJSA Journal*, 3A: 449 (1988)
 Horikawa T. et al. *RIE (In Japanese)*, 40 (4): 413 (1994)

Structure of "Phyto-Ceramide"



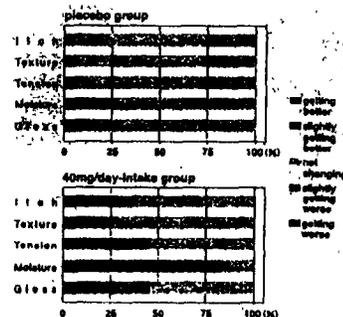
Safety data of "Phyto-Ceramide"

Acute toxicity (LD50): minimum 5,000mg/kg.
 Mutation test: negative.
 Residual agricultural pesticides: below standards (48 pesticides that have residual standards for Konjac-tuber)

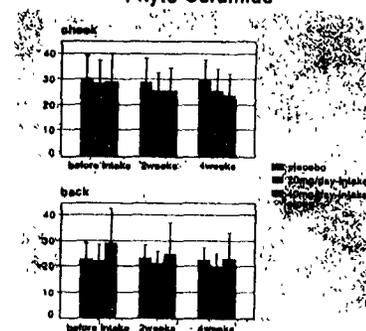
Scheme of producing "Phyto-Ceramide"



Results of questionnaire after 4 weeks intake of "Phyto-Ceramide"



The changes in trans-epidermal water loss (TEWL) through 4 weeks intake of "Phyto-Ceramide"



Products standards of "Phyto-Ceramide"

Components, Glucosylceramides:
 minimum 3% (powder type), 0.3% (emulsion type)
 Water contents:
 maximum 5% (powder type)
 Heavy metals:
 maximum 20 ppm (as Pb)
 Arsenic:
 maximum 1 ppm (as As₂O₃)
 Standard plate count:
 maximum 3,000 cfu/g
 Moulds:
 maximum 1,000 cfu/g
 Pathogenic indicator organism,
 not detectable

8% PASTE

Examples of displaying "Phyto-Ceramide" as materials of food products

*Konjac extract (including ceramides)

Supply

Powder types: 100 g, 1 kg (both in aluminum package)
 Emulsion types: 1 kg (in a plastic bottle), 10 kg (in a metallic can)

Storage

Powder types: Store at room temperature (keep in cool and away from light)
 Emulsion types: Store in a refrigerator (2°C - 10°C)

Kenko Corporation



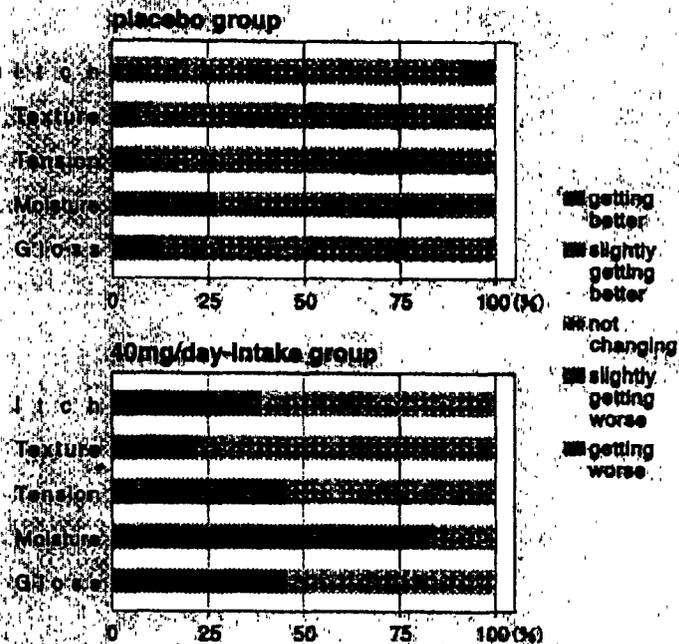
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Chiyoda-ku, Tokyo 101-0047, Japan
Tel.(03)3258-8061 Fax.(03)3258-8060 E-mail: kenkoco@ma.kcom.ne.jp
Osaka Office (Osaka, Japan): Tel.(06)6222-9691 Fax.(06)6222-9693

Certificate of Analysis

Producer	Unitika Corporation
Product Name	Konjac Ceramide Concentrate Liquid
Lot No.	SMPL

Item	Standard	Test Results
Appearance	Brown viscous liquid with Peculiar odor	Complies
Assay (Ceramide)	not less than 8%	10.9%
Arsenic	not more than 1.0 μ g/g	Complies
Heavy metals	not more than 10 μ g/g	Complies
Total plate count	not more than 3×10^3 pcs./g	Complies
Mold	not more than 1×10^3 pcs./g	Complies
Coliform Group	negative	

4 weeks intake of "Phyto-Ceramide"



Products standards of "Phyto-Ceramide"

Components, Glucosylceramides:
minimum 3% (powder type), 0.3% (emulsion type)

Water contents:
maximum 5% (powder type)

Heavy metals:
maximum 20 ppm (as Pb)

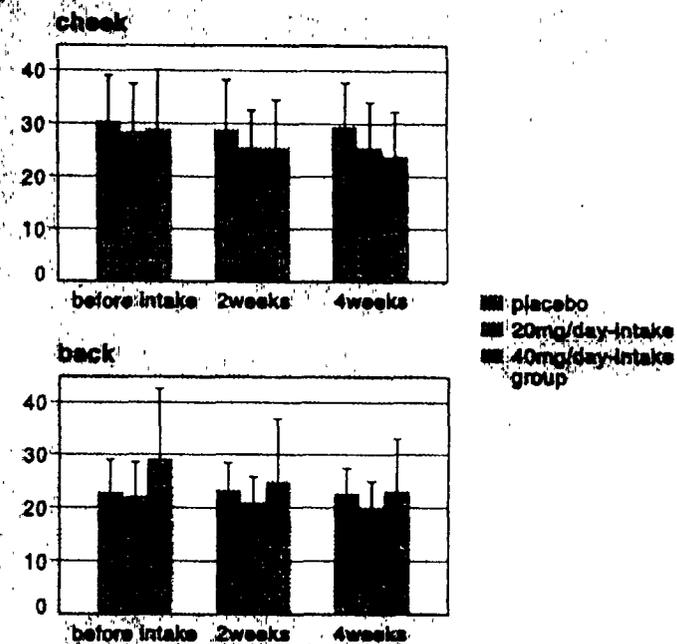
Arsenic:
maximum 1 ppm (as As₂O₃)

Standard plate count:
maximum 3,000 cfu/g

Moulds:
maximum 1,000 cfu/g

Pathogenic indicator organism:
not detectable

loss (TEWL) through 4 weeks intake of "Phyto-Ceramide"



Examples of displaying "Phyto-Ceramide" as materials of food products

"Konjac extract (including ceramides)"

Supply

Powder types: 100 g, 1 kg (both in aluminum package)

Emulsion types: 1 kg (in a plastic bottle), 18 kg (in a metallic can)

Storage

Powder types: Store at room temperature
(keep in cool and away from light)

Emulsion types: Store in a refrigerator (2°C-10°C)