TOYO HAKKO

Anti-glycation material of fermented isoflavone aiming for anti-aging

UNIFINE®-CO

We succeeded in developing a raw material that is composed mainly of the anti-aging material, “8-hydroxyisoflavones”, with a high anti-glycation effect, by fermenting soybean extract with Aspergillus oryzae.

UNIFINE®-CO	
INCI	Component ratio (%)
Aspergillus/ Soybean Seed Extract Ferment Extract Filtrate	20
Butylene Glycol	80
Standard packing	1kg/brown bottle
Storage	Store in a dark place at room temperature

Standard item	Standards	Test method
Appearance	Yellowish brown to brown liquid	Sensory test
Identification: Isoflavones	Peak is detected in HPLC analysis	HPLC
pH	3.0–4.5	JSQI general test method
Residue on ignition	Not more than 2.0%	JSQI general test method
Residue on drying	More than 0.5%	Atmospheric heating drying method
Specific gravity	Actual measured value	Vibration-type density meter
Assay：Total isoflavones content	Actual measured value	HPLC
Assay：8-hydroxy isoflavones content in the total isoflavones	Actual measured value	HPLC
Heavy metal s （as Pb）	Not more than 20ppm	JSQI general test method
Arsenic（as As2O3）	Not more than 2.0ppm	ICP emission spectrometry
Aerobic plate count	Not more than 100cfu/ml	SCDLP agar culture
Coliform organisms	Negative	AOAC (Petrifilm method)
Viable molds and yeasts count	Not more than 100cfu/ml	AOAC (Petrifilm method)

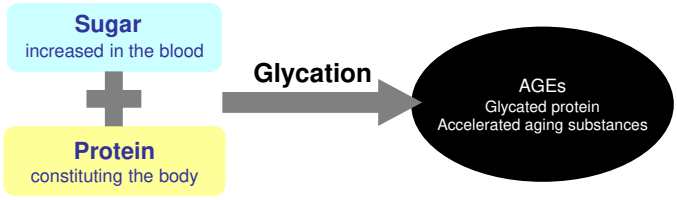
SAFETY TEST ITEM	RESULT
Skin irritation test (OECD TG 439)	Non-irritant(concentration : 10%)
Eye irritation test (OECD TG 492)	Non-irritant(concentration : 10%)
Phototoxicity test (OECD TG 432)	Negative(concentration : 100%)
Human patch test (24 hours occlusion 20 human)	Safety(concentration : 10%)
Repeat insult patch test (50 human)	Primary irritancy,Non-irritant and non-sensitizer(concentration : 10%)

(Concentration: as UNIFINE®-CO)

Characteristics of UNIFINE®-CO

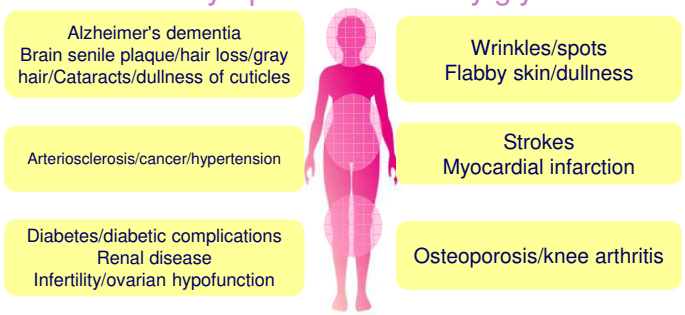
- Anti-glycation material containing 8-hydroxyisoflavones as active ingredients, which are made by fermenting soybean extract containing isoflavones with Aspergillus saitoi. (Patent No. 5318339) Joint research with Sugiyama Jogakuen University
- Confirmed inhibitory effects of glycation reaction products (CML, 3DG, Pentosidine)
- Confirmed glycation product decomposition effect
- Confirmed the effect of preventing flabby skin via collagen glycation.
- Confirmed to suppress the browning of the skin due to glycation.
- Confirmed to suppress the production of carbonyl protein, which causes the yellowish dullness of the skin.
- Also confirmed the inhibitory effects of tyrosinase and collagenase as beautiful skin effects
- Confirmed antioxidant capacity (DPPH, OH radical scavenging ability)
- All of the above functionalities have been improved via fermentation with Aspergillus oryzae. and are most suitable for product planning aiming at anti-aging.
- Food ingredient UNIFINE® is also available. . The combination of UNIFINE® and UNIFINE®-CO enhances the skin beautifying effect.

Aging and disease are caused by glycation in the body.

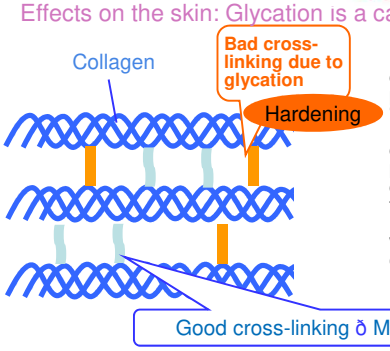


AGEs (Advanced glycation end-products)
Substances produced by the glycation of proteins in cells and tissues, and which can directly cause disease by causing malfunction in the body.

Diseases and symptoms caused by glycation



Effects on the skin: Glycation is a cause of wrinkles/flabby skin.



In the triple-helical structures of collagen, a bond is made via physiological cross-linking, i.e. “good cross-linking,” which helps to maintain appropriate elasticity of collagen fibers. However, when non-physiological cross-linking, i.e. “bad cross-linking,” is formed by AGEs that are formed via glycation reactions, collagen fibers are weakened. As a result, the elasticity of the skin degrades, resulting in the hardening of the skin.

URL http://www.toyohakko.com/en

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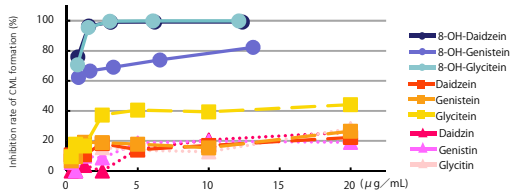
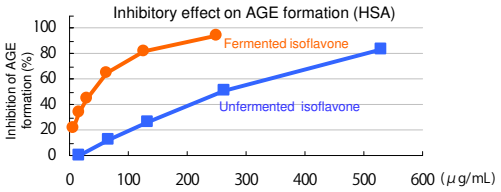
Experiment Data

UNIFINE®-CO

(1) Improvement of anti-glycation function by fermentation : Active ingredient of 8-hydroxyisoflavones

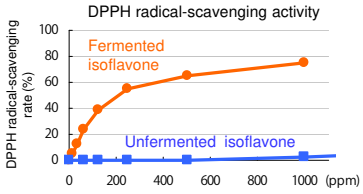
Anti-glycation: Inhibition of the glycation of human serum albumin/inhibition of CML formation.
Regarding fermented isoflavone and unfermented isoflavone, the inhibitory effect on AGE formation was assessed via the glycation reactions of glucose and HSA (human serum albumin).
As a result, fermented isoflavone was confirmed to have an extremely high inhibitory effect on fluorescent AGE formation compared to unfermented isoflavone.
In addition, it was confirmed the inhibitory activity of isoflavones was also examined for CML production. Daidzein and genistein, which are aglycones, than daidzin and genistin, which are glycosides, and hydroxylated derivatives such as 8-OH-daidzein and 8-OH-genistein have much higher inhibition of CML formation. From these results, 8-hydroxyisoflavones was confirmed to have strong anti-glycation activities compared to aglycon and glycoside.

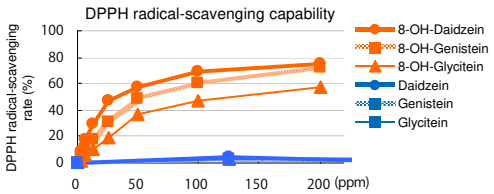




Antioxidation: DPPH radical-scavenging activity

It was confirmed that fermented isoflavone has an antioxidation capability that is significantly higher than unfermented isoflavone. It was also confirmed that 8-hydroxy-isoflavones plays an important role as an active ingredient that demonstrates antioxidation effects.



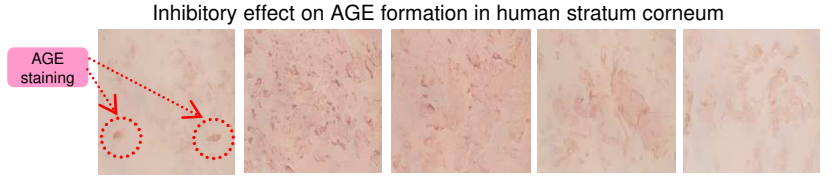


(2)Inhibition of AGE formation and the acceleration of the decomposition of skin tissue: Prevention of flabby skin/improvement of elasticity

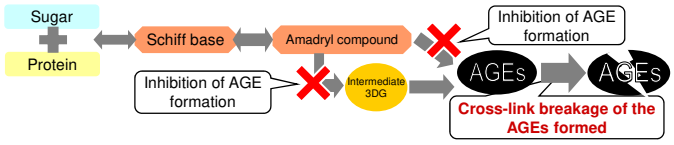
AGEs produced via a reaction with human stratum corneum obtained via the tape stripping method with glyoxal were immunostained, and the degree of glycation was assessed. As a result, it was confirmed that UNIFINE-CO inhibits AGE formation induced by glyoxal as a glycation reaction promotor.

Human stratum corneum obtained via the tape stripping method was immunostained, and the effect of UNIFINE-CO on the decomposition of AGEs was studied. As a result, it was confirmed that immunostaining intensity was decreased in a concentration dependent manner and that AGEs in the corneocytes were decomposed and removed.

Inhibitory effect on AGE formation in human stratum corneum



Glyoxal	–	+	+	+	+
UNIFINE-CO	0	0	0.156	1.25	10.0% (%)



Effect on the decomposition of AGEs in human stratum corneum

0 2.0 10.0

UNIFINE-CO concentration (%)

(3)Inhibition of melanin production/inhibition of collagen decomposition: Skin-lightening/anti-wrinkling

It was confirmed that fermented isoflavone has higher inhibitory effects against tyrosinase and collagenase than unfermented isoflavone. Therefore, compared to unfermented isoflavone, a higher skin-whitening effect as well as anti-wrinkle effects via the inhibition of collagen decomposition can be expected with fermented isoflavone.