

Anti-glycation food solutions

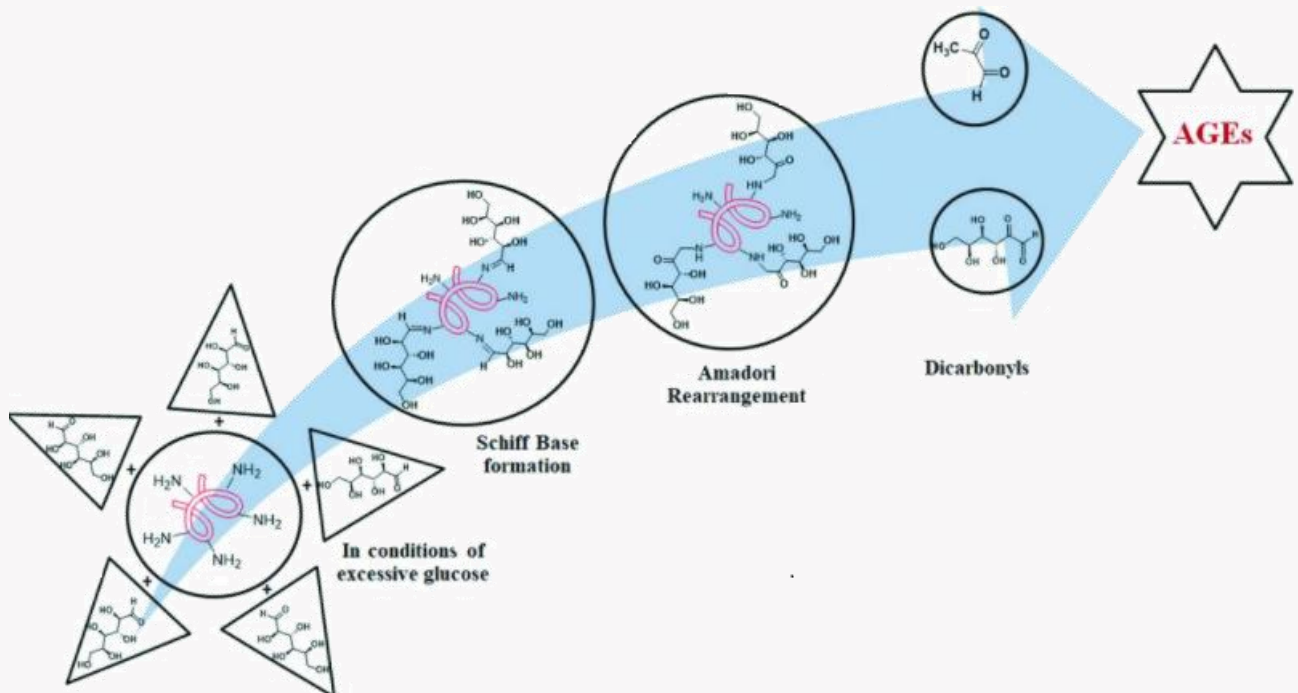
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Kangcare Bioindustry Co.,Ltd



Research background:

Sugars, such as glucose, glyceraldehyde, and methylglyoxal, can react nonenzymatically with the amino groups of lipids, proteins, and nucleic acids to form senescent macromolecules termed advanced glycation end products (AGEs). Accumulating evidence has suggested that AGEs not only alter the structural integrity and function of macromolecules but also evoke oxidative stress generation and inflammatory reactions in various types of cells and organs through the interaction with a receptor for AGEs (RAGE), thus contributing to the development and progression of numerous aging- and diabetes-related complications, including atherosclerotic cardiovascular disease cancer growth and metastasis, osteoporosis, and Alzheimer's disease.



AGEs are known to cause aging and dullness to the skin. The human skin tissue contains a large number of collagen and elastin, which mostly exist in the form of fiber and constitute the skeleton structure of the skin, making the skin have a certain strength and elasticity. AGEs can cross-link with these two proteins, affecting not only their normal function, but also skin cell adhesion and cell growth. At the same time, the accumulation of AGEs and the cross-linkers of these two proteins in the cellular matrix not only reduces the permeability of connective tissue, but also weakens the diffusion ability of nutrients and metabolic wastes in the body, increases the hardness of the skin tissue, and leads to decreased skin elasticity, eventually leading to aging and wrinkles of the skin.



Recommended raw materials:

● Amino acid

In connection with glycation, free amino acids have been found to mitigate the glycation of lens protein, delay progression of cataract and also bring down blood sugar levels in diabetic rats. Some amino acids inhibit or reduce glycation by hampering the binding of glucose to proteins by competitive inhibition, thereby offering protection, while some amino acids influence pathological pathways resulting in increased tissue sensitivity towards insulin.



● **L-Carnosine**

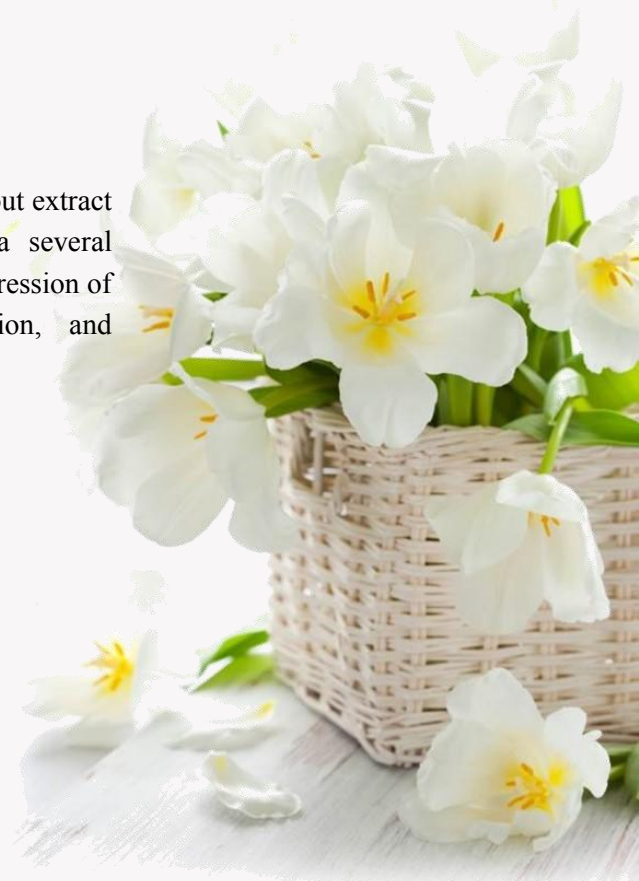
The naturally-occurring dipeptide, carnosine (β -alanyl-L-histidine), present in many organisms in muscle and nervous tissues, has been demonstrated to possess anti-glycation activity. Though multiple mechanisms are probably involved, carnosine was found to inhibit AGE formation by quenching reactive carbonyl species. Modifications at the carboxyl terminus or the β -alanine carbon skeleton were found to improve the pharmacokinetic profile without drastically affecting the quenching activity. A C-terminus capping strategy resulted in improved plasma stability as recognition by enzymes was hampered. Conversely, the primary amino group and the imidazole ring were found to play important roles in the observed activity and modifying them greatly reduced the efficiency and/or selectivity towards reactive carbonyl species. Carnosine is also capable of effecting transglycation. Carnosine may play a role in assisting the unfolding of damaged proteins and in solubilizing precipitated protein aggregates, possibly through disruption of complementary binding between AGE-related hydrophobic patches.

● **Curcumin**

Curcumin has been found to be an effective antioxidant, inhibiting lipid peroxidation and chelating metals more effectively than other antioxidants. It also inhibits enzymes such as lipoxygenase and cyclooxygenase, thereby preventing excessive damage to lipids, sugars, proteins, and nucleic acids. This bioactive compound also prevents protein aggregation, including amyloid, lysase, and insulin, thereby counteracting protein deposition, which has been linked to the development of a variety of diseases, including Alzheimer's disease and type 2 diabetes.

● **Aqueous Extract of Seed of Broccoli**

Present study suggests that glucoraphanin-rich broccoli sprout extract may exert beneficial actions against vascular injury via several mechanisms, such as the inhibition of AGE formation, suppression of inflammatory reactions, reduction of RAGE expression, and upregulation of eNOS mRNA levels.





●VB1 Thiamine Hydrochloride

It is a cofactor of transketolase (TKT) and a key enzyme of the TKT pentose phosphate pathway (PPP), the main product of which is NADPH, which inhibits AGEs production.

●Pyridoxamine

PM may find use in the treatment of a wide range of chronic diseases in which oxidative stress, inflammation and tissue damage lead to increased chemical modification of protein. By trapping chemical intermediates that may not only modify proteins, but also enhance oxidative damage, PM may protect against cycles of oxidative stress and tissue damage. While it may not inhibit the chemical modification of proteins during normal aging, PM may delay pathology associated with a number of age-related diseases and thereby contribute to a healthier lifespan.

●Niacinamide

The reduced forms (NADH and NADPH) of nicotinamide adenine dinucleotide (NAD) and its phosphate derivatives (NADP) inhibit Krebs and ETC. This reduces ROS production, which in turn reduces AGEs production.

●Ascorbic acid

It has nonspecific metal chelating activity and indirectly inhibits AGEs formation by blocking ROS and free transition metal ions.



Anti-glycation food solutions

According to the market demand, Kangcare launched the latest research and development results for users' pain points: Anti-glycation food solutions



Formula design idea:

This product is designed to reduce the level of free radicals, block ROS, chelate and catalyze the metal ions of Amadori reaction, reduce the generation of carbonyl intermediates to inhibit the formation of AGEs, reduce the accumulation of AGEs, and inhibit the carbonylation of proteins.

Solution 1:

Dosage forms: Solid beverage

Packaging: 2g/bag

Usage mode: 1-2bag/day; (Pour one bag into a cup and stir 400ml warm water to serve; Pour directly into mouth and swallow with water), dissolve in warm water with temperature below 37°C

Formula:

Ingredient	Specification	Additive amount
Bifidobacterium longum Powder BL21	3.0×10^{11}	1-8%
Curcuminoids	Instantized 10% UV	1-8%
Green Tea Extract	EGCG 95%	0.1-3%
Aqueous Extract of Seed of Broccoli	Glucoraphanin 13%	0.1-1%
Vitamin C	99%	1-5%
Vitamin B1	Thiamine Hydrochloride	0.0009~0.0022%
Vitamin B3	Niacin	0.011~0.033%
Vitamin B6	Pyridoxine HCl	0.0007~0.0022%
Inulin	90%	5-25%

Erythritol	99%	5-25%
Sodium citrate	-	0-20%
Resistance dextrin	98%	20-40%
Flavor substance	-	1-10%

Solution 2:

Dosage forms: Liquid beverage

Packaging: 100ml/bottle

Usage mode: 1-2bottle/day; Sodium hyaluronate various active ingredients sweet regulator sour flavor regulator in turn into the pure water, stir evenly, the solution obtained by ultra-high temperature instantaneous sterilization, canned.

Formula:

Ingredient	Specification	Additive amount
Sodium Hyaluronate	80000-0.1MDa	0.05-0.1% (1:2:4)
Sodium Hyaluronate	0.8M-1.5MDa	
Sodium Hyaluronate	1.8M-3.0M	
Curcuminoids	Instantized 10% UV	0.1-3%
Aqueous Extract of Seed of Broccoli	Glucoraphanin 13%	0.1-0.5%
Vitamin C	99%	0.5-1.5%
Vitamin B1	Thiamine Hydrochloride	0.0002~0.0003%
Vitamin B3	Niacin	0.0003~0.0018%
Vitamin B6	Pyridoxine HCl	0.00004~0.00006%
Erythritol	99%	1-3%
Sodium citrate	-	0-3%
Flavor substance	-	1-3%
Water	-	100ml

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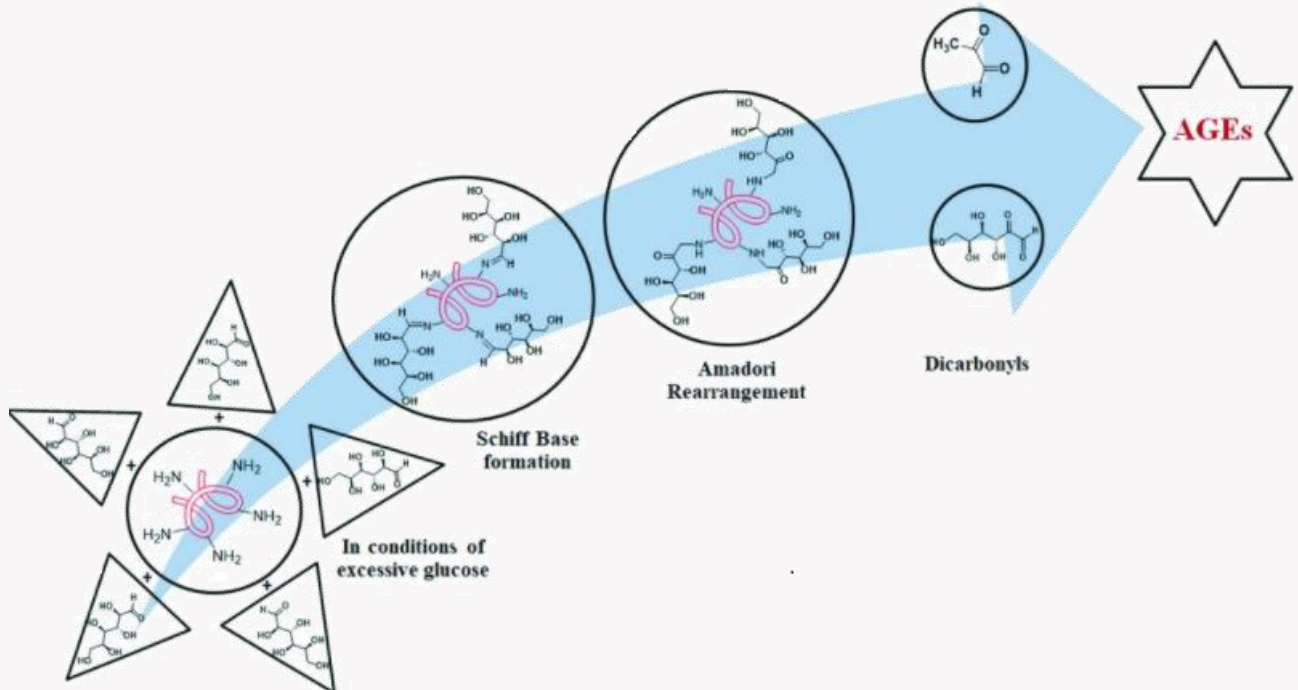
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研究背景:

糖，如葡萄糖、甘油醛和甲基乙二醛，可以与脂类、蛋白质和核酸的氨基发生非酶反应，形成衰老的大分子，称为晚期糖基化终产物(AGEs)。越来越多的证据表明，AGEs 不仅改变了大分子的结构完整性和功能，而且还通过与 AGEs 受体(RAGE)的相互作用，在各种细胞和器官中引发氧化应激和炎症反应，从而促进了许多与衰老和糖尿病相关的并发症的发展和进展，包括动脉粥样硬化心血管疾病、癌症生长和转移、骨质疏松症和阿尔茨海默病。



众所周知，AGEs 会导致皮肤老化和暗沉。人体皮肤组织含有大量的胶原蛋白和弹性蛋白，它们大多以纤维的形式存在，构成皮肤的骨架结构，使皮肤具有一定的强度和弹性。AGEs 可与这两种蛋白交联，不仅影响其正常功能，还影响皮肤细胞粘附和细胞生长。同时，年龄的增长导致这两个蛋白在细胞矩阵的交联不仅降低了结缔组织的渗透率，也削弱了营养物质在体内的扩散能力和代谢废物的排出，增加皮肤组织的硬度，并导致皮肤弹性下降，最终导致皮肤老化和皱纹。



推荐原料:



●氨基酸

游离氨基酸已被发现可以减轻晶状体蛋白的糖基化，延缓白内障的进展，并降低糖尿病大鼠的血糖水平。有些氨基酸通过竞争性抑制阻碍葡萄糖与蛋白质的结合，从而抑制或减少糖基化，从而提供保护，而有些氨基酸影响病理途径，从而增加组织对胰岛素的敏感性。

● 肌肽

天然存在的二肽肌肽（ β -丙氨酸-L-组氨酸）存在于肌肉和神经组织的许多生物体中，已被证明具有抗糖基化活性。尽管可能涉及多种机制，肌肽被发现通过猝灭活性羰基物种来抑制 AGE 的形成。在羧基末端或 β -丙氨酸碳骨架上的修饰被发现在不显著影响猝灭活性的情况下改善了药代动力学谱。它可以提高血浆稳定性，因为它阻碍了酶的识别。肌肽也能影响糖基化。肌肽可能在协助受损蛋白的展开和溶解沉淀蛋白聚集物中发挥作用，可能是通过破坏相关疏水斑块之间的互补结合。

● 姜黄素

姜黄素已被发现是一种有效的抗氧化剂，抑制脂质过氧化和螯合金属比其他抗氧化剂更有效。它还能抑制脂肪加氧酶和环加氧酶等酶，从而防止对脂质、糖、蛋白质和核酸的过度破坏。这种生物活性化合物还能防止蛋白质聚集，包括淀粉样蛋白、裂解酶和胰岛素，从而抑制蛋白质沉积，而蛋白质沉积与多种疾病的发展有关，包括阿尔茨海默病和 2 型糖尿病。

● 西兰花种子水提物

目前的研究表明，富含萝卜硫苷的西兰花种子水提物可能通过抑制 AGE 的形成、抑制炎症反应、降低 RAGE 的表达和上调 eNOS mRNA 水平等机制对血管损伤起到有益的作用。





●VB1

它是转酮醇酶(TKT)的辅助因子,是 TKT 戊糖磷酸通路(PPP)的关键酶,其主要产物是 NADPH,抑制 AGEs 的产生。

●VB6

PM 可用于治疗广泛的慢性疾病,在这些疾病中,氧化应激、炎症和组织损伤导致蛋白质的化学修饰增加。通过捕获化学中间体,这些中间体不仅可以修饰蛋白质,还可以增强氧化损伤,PM 可以防止氧化应激和组织损伤的循环。虽然它可能不会在正常衰老过程中抑制蛋白质的化学修饰,但 PM 可能延缓与许多年龄相关疾病相关的病理,从而有助于更健康的寿命。



●烟酰胺

烟酰胺腺嘌呤二核苷酸(NAD)及其磷酸衍生物(NADP)的还原形式(NADH 和 NADPH)抑制 Krebs 等。这减少了 ROS 的产生,反过来又减少了 AGEs 的产生。

●抗坏血酸

它具有非特异性金属螯合活性,通过阻断 ROS 和自由过渡金属离子间接抑制 AGEs 的形成。

抗糖化食品解决方案

根据市场需求，kangcare 出针对用户痛点的最新研发成果：抗糖基化食品解决方案



配方设计思路：

本产品旨在降低自由基水平，阻断 ROS，螯合和催化 Amadori 反应的金属离子，减少羰基中间体的生成，抑制 AGEs 的形成，减少 AGEs 的积累，抑制蛋白质的糖基化。

解决方案 1：

剂型：固体饮料

包装方式：2g/袋

使用方式：每日 1-2 次，8g/次（一袋倒入杯中加入 400ml 的温水搅拌饮用；直接倒入口中，随水吞服），溶解温度为 37℃ 以下的温水。

配方：

原料	规格	添加量
长双歧杆菌菌粉 BL21	3000 亿 cfu/g	1-8%
姜黄提取物	速溶 10% UV	1-8%
绿茶提取物	EGCG 95%	0.1-3%
西兰花种子水提物	萝卜硫苷 13%	0.1-1%
维生素 C	99%	1-5%
维生素 B1	盐酸硫胺	0.0009~0.0022%
维生素 B3	烟酸	0.011~0.033%
维生素 B6	盐酸吡哆醇	0.0007~0.0022%
菊粉	90%	5-25%
赤藓糖醇	99%	5-25%
柠檬酸钠	-	0-20%
抗性糊精	98%	20-40%
风味物质	-	1-10%

方案 2:**剂型:** 液体饮料**包装方式:** 100ml/瓶**使用方式:** 每天 1-2 瓶, 透明质酸钠、各种活性成分、甜味调节剂、酸味调节剂依次加入纯净水中, 搅拌均匀, 得到溶液。得到的溶液采用超高温瞬时杀菌法杀菌, 罐装, 得饮料。**配方:**

原料	规格	添加量
透明质酸钠	601330	0.05-0.1% (1:2:4)
透明质酸钠	601360	
透明质酸钠	601380	
姜黄提取物	速溶 10% UV	0.1-3%
西兰花种子水提物	萝卜硫苷 13%	0.1-0.5%
维生素 C	99%	0.5-1.5%
维生素 B1	盐酸硫胺	0.0002~0.0003%
维生素 B3	烟酸	0.0003~0.0018%
维生素 B6	盐酸吡哆醇	0.00004~0.00006%
赤藓糖醇	99%	1-3%
柠檬酸钠	纯品	0-3%
风味物质	-	1-3%
水	-	100ml