



WHAT SUGAR DOES TO SKIN

Before we begin, let's get one thing straight. We're not suggesting you give up every skerrick of sugar, forever. But as with most things that feel good (but aren't so great for our health), moderation is key. And the same goes for skin. "When glucose isn't burnt or used efficiently, and particularly if there's large amounts present, it has spin-off effects. And one of those is advanced glycation end products, or AGEs," explains Professor Merlin Thomas, clinical scientist at the Baker IDI Heart & Diabetes Institute and co-author of *Fast Living Slow Ageing* (slowageingbook.com).

So what exactly are A-G-Es? As the name suggests, they age our body and our face—literally. Advanced glycation end products are formed when a glucose molecule sticks to a protein such as collagen or elastin. Emma Hobson from the International Dermal Institute describes how it works: "Imagine your left hand is the sugar and your right hand is the collagen. Make your fingers interlock with one another and

FAST FACT

2 in 3 Aussies are trying to eliminate something from their diet, with refined sugar at the top of their hit list

they'll become trapped," she says. "Once they bind, they stiffen, and are no longer repairable." Our skin deals with ageing by singling out the old and replacing it with the new, so when this natural function is obstructed and your skin can't produce as many fresh, healthy proteins, the visible signs of ageing occur. Think fine lines, sallowness and a deterioration of skin texture. For most women, the process starts slowly, but is usually well established by the time we hit our 20s. "You can start to see the first signs of ageing—lines around your eyes—anytime after age 23," Hobson says. "Of course, genetic factors play a role too, but AGEs are one of the causes of premature ageing."

WHAT THE EXPERTS SAY

Surprising but true: most of what we know about glycation stems from diabetes research, and what they've discovered could do great things for your skin. The reason? Researchers have found that the connective-tissue damage and chronic inflammation suffered by diabetics, due

to continuously high blood sugar, can lead to conditions such as cataracts, vascular tightening and diseases of the pancreas and liver. As people with type 2 diabetes have a reduced ability to control their glucose levels efficiently, glycation is accelerated. And so, in addition to an increased risk of health issues, they also tend to visibly age faster. "In general, for every year a person has diabetes, [their skin] is a year older than it should be. So, for example, someone who's 60 who's had 20 years of diabetes, can have the skin of an 80 year old if you look at it in a biopsy. It's really quite damaging," Thomas explains.

Even if you don't have diabetes, glycation still matters, since it can trigger inflammation, one of the major causes of skin ageing. "When protein and sugar lock, it can stimulate what's called a receptor site [known as receptor for advanced glycation end products, or RAGE]," Hobson says. On activation, RAGE indirectly switches on the inflammatory genes. And once they're on, the flame can continue to burn long-term, and that's bad news for your complexion. "Inflammation is a major producer of free radicals, used by the immune system to get rid of damaged cells," Thomas adds. "However, free radical damage is indiscriminate and results in collateral damage if left firing away. And what that means is that you can lose fullness, firmness and skin texture."

Love to spend time in the sun or crunch on crackers and toasted foods? Lifestyle factors can greatly influence the speed at which AGEs form. In a report published in *Clinics in Dermatology*, Dr William Danby writes: "Ultraviolet exposure increases cross-linking in the skin." Not only does your skin have sugar molecules to contend with, but the sun's rays will glycate collagen too.

But it turns out that a love of doughnuts and cupcakes isn't the only culprit when it comes to fine lines. Much has been written about foods

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Glycated collagen accumulates at a rate of 3.7% yearly, according to Dr William Danby from the Geisel School of Medicine in the US

with pre-formed AGEs, that is, foods that have been cooked at very high temperatures or for prolonged periods. Seared or charred foods are the worst. "When we brown food, it not only changes its colour but it also creates new compounds that add flavour, texture and aroma," Thomas says. So the crust of bread, cakes, cooked meat, roasted cashews, and just about anything moreish contains high levels of AGEs that could speed ageing. But that's not all. "Excessive consumption of AGEs may be linked to conditions like cancer, diabetes and narrowing of the arteries." Even more reason to limit our intake.

Another factor that comes into play: smoking. "Free radicals in smoke cause a number of molecular changes that impair healing and healthy skin turnover," Thomas says. "The skin's natural antioxidant defences are so depleted dealing with the smoke that they can't deal with ageing." Yet another reason to butt out, wouldn't you say?

WHAT YOU CAN DO ABOUT IT

According to dermatologists, it's possible to slow the formation of glycation—and save your skin, simultaneously. Their advice? Attack it two ways.

Diet

First, the obvious one: glucose. Yes, sugary processed foods such as cakes and lollies are best kept as occasional treats. "You have to be very careful with your processed sugars because they [leave] a reactive chemical in the body," Hobson says. Thomas believes it's not so much the 'what' but the 'how much'. "The important thing [is] reducing the amount we eat," he says. Thomas also recommends eating more fresh fruits ▶

Smart wrinkle-fighting food swaps

It's not just the cupcakes that count! Every food has an AGE value, depending on how it's cooked. Make these simple swaps to boost your health—and keep your skin looking younger for longer.

INSTEAD OF	TRY	WHY?
Fast food fries	Sweet potato mash	For 87 times fewer AGEs
Fried eggs	Hard-boiled egg	For 62 times fewer AGEs
Fried Atlantic whiting	Fresh salmon sashimi	For 16 times fewer AGEs
Biscotti	A bagel	For 30 times fewer AGEs

and vegetables. "It's not rocket science, but it turns out this approach to eating also has a very strong basis with respect to advanced glycation." Second: aim to use more water-based cooking techniques. Pick a poached or boiled egg over fried; fresh salmon over grilled; and marinate steak in lemon juice or vinegar before you throw it on the BBQ as low pH liquids have been found to naturally slow down these ageing compounds.

Any expert will tell you prevention is key, as cross-links are irreversible. While nothing dietary has been found to abolish AGEs, some natural compounds can inhibit their production. On the list: cinnamon, cloves, oregano, ginger, garlic and alpha-lipoic acid (found in broccoli and spinach). Derms expect to see these crop up in topical skin treatments in the near future. But for now, the best defence is including them in your daily diet.

NATURAL COMPOUNDS IN CINNAMON, SPINACH, GINGER, AND GARLIC DEFEND SKIN FROM DAMAGE—SO EAT UP!

Diabetic? We don't need to explain how to manage sugar intake, but you may be interested in this: Danby's research reveals that with strict glycaemic control, the development of AGEs can be slashed by 25% in four months. Relatively speedy results for skin that looks younger longer!

Skincare

In addition to diet, the products you choose can also make a difference. Hobson suggests searching for products with ingredients she calls sugar traps. These act as filler and prevent sugar and protein molecules from binding. Two of the main ones to look out for on the label include arginine/lysine (a peptide) and soy protein. Blueberry extract, a powerful antioxidant, is also known to protect against glycation. Or if inflammation is your main concern, knock it on its head with topical retinoids (used in everything from serums to moisturiser), which also inhibit collagen breakdown.

And as for cutting down on your consumption of sugary edibles, all you have to do is look in the mirror. The truth is, you're sweet enough. **27**



YOUNGER SKIN, FROM WITHIN!

Look fresher, younger and healthier, fast! We asked dermatologists, nutritionists and skin experts for their top anti-ageing tips. And trust us, they're good. Find them now at preventionmag.com.au/beauty.

YOUR NEW ANTI-GLYICATION TOOL KIT

Put the brakes on skin ageing with these three clever AGE-fighters



1. **Chanel Ultra Correction Line Repair Fluid** (\$153, 02 9900 2944) aims to soften bonded proteins with its unique "deglycation enzyme" and restore volume to the skin. Treat it like a serum and slather it on morning and night for best results.
2. **Dermalogica Antioxidant Hydramist** (\$55, dermalogica.com.au) prevents proteins and sugars cross-linking with arginine/lysine polypeptide, an effective sugar trap. Lightly spritz it over your face after cleansing. Or use it to refresh your make-up (and fend off AGEs) throughout the day.
3. **Blueberry extract in SkinCeuticals A.G.E. Eye Complex** (\$149, advancedcosmeceuticals.com.au) not only inhibits AGE. Proxylane increases skin elasticity and microfine light reflectors instantly brighten tired-looking eyes. Like eight hours of quality sleep in a jar.