

VITAMIN C... ...to be or not to be?

scientific FEATURE

Fruit for the skin...

by Dr Wade Cheng



Vitamin C or Ascorbic acid exists naturally in many fruits and vegetables.

Oranges and tomatoes are particularly rich in the

vitamin. Deficiency of vitamin C causes the disease scurvy, symptoms of which are bleeding of the gums and beneath the skin.

Pure vitamin C can be made in the form of a dry powder which is fairly stable. In this form it can be stored for quite a long time in capsules, tablets or as a dry powder. Aqueous solutions of vitamin C are however easily oxidised by air and light, turning a brownish colour. This liquid form of the vitamin is unstable and is difficult to use in cosmetic products.

Rather like vitamin E, the absorption of vitamin C from the stomach and intestines is poor. Only 20-30% of the intake is absorbed and transported to the rest of the body by the blood system. The human body maintains a total pool of about 1,500mg of vitamin C.

The vitamin is used primarily by bodily functions. However, physical and emotional stress can use significant amounts of vitamin C. Smoking too, consumes a lot of

extra
vitamin

C. Experts recommend that smokers increase their vitamin C intake to 200mg per day as opposed to the normal daily requirement of 60mg per day. It is clear to see that smokers may easily and unknowingly suffer from vitamin C deficiency.

The amount of ingested vitamin C reaching the skin via blood circulation is very limited. The skin, and particularly the delicate facial skin, which is exposed to the environment is thus susceptible to vitamin C deficiency. Vitamin C can be absorbed through the skin, which means that topical applications can have its advantages.

The skin has an affinity for vitamin C and with a small molecular size (its molecular weight is only 176.12 and is less than citric acid) can easily be absorbed. After absorption, the vitamin cannot be lost by washing or by perspiration and is effective for up to three days.

VITAMIN C AND THE SUN:

The vitamin is beneficial in both helping to prevent and repair sun damage. Experimental work using comparable situations demonstrated much less damage to skin protected by the application of topical vitamin C. Similarly the application of topical vitamin C resulted in significantly faster healing of damaged skin.

Vitamin C can help protect the skin from sun damage but has a very different mechanism from the traditional sunscreen. Sun protection by vitamin C decreases as time goes by because the vitamin is used up in the protection process.



Just like an anti-oxidant, it is itself oxidised whilst it protects the skin. Thus the concentration of vitamin C will decrease and as it does so its protective ability also decreases. The sunscreen has a stable performance over time unless it is removed - the sunscreen itself is not changed during the protection process and only once it has been removed from the skin, will the protection disappear. Vitamin C cannot be removed and its effect will remain until the concentration diminishes.

HOW TO OBTAIN THE BEST PROTECTION FROM THE SUN!

Apply vitamin C to the skin first as an internal protection and then apply a sunscreen on the skin as an external protection.

For instance with a sunscreen of SPF 20, 5% of the original UV light would go through the sunscreen and penetrate the skin. The internal vitamin C could take care of penetrating UV light very well. Vitamin C cannot replace sunscreen but it does provide excellent secondary sun protection. If no traditional sunscreen is used, the vitamin C in the skin would be quickly used up and its protective ability would rapidly decrease. If there is no vitamin C in the skin, the sunlight passing through the sunscreen will cause damage. It should be noted that any vitamin C not absorbed into the skin (ie, still in a cream or on the surface of the skin) does not provide any protection. Therefore a high concentration of vitamin C compound needs to be applied in an easily absorbed form as the first layer of protection. Vitamin C in any cream or sunscreen is not effective for sun protection because of poor penetration into the skin.

VITAMIN C AND ITS SKIN WHITENING EFFECT:

Hydroquinone is the traditional bleaching agent used in anti-pigmentation products. 2% Hydroquinone is very popular and 4% strength is a prescribed item used by dermatologists. In Vitro experiments show that vitamin C has about 6% the bleaching capacity of hydroquinone.

Unlike Hydroquinone, vitamin C does not have side effects and can be used for long term application. A high concentration of the vitamin has been found effective in preventing freckles and brown spots on the skin. Skintone can be noticeably improved usually after 2 weeks of daily use. The anti-pigmentation effect is of benefit to the skin and has been widely used in skin whitening and bleaching products.

A DESIRABLE TOPICAL VITAMIN C FORMULA SHOULD:

- Contain stable vitamin C derivatives- natural vitamin C tends to deteriorate quickly and become brown.
- Be capable of being easily absorbed into the skin - there has to be a compromise between product stability and skin absorption.
- Also be able to easily reconvert back into the natural and active vitamin C form after being absorbed by the skin (eg. magnesium chelate).
- Have a minimum 5% concentration of active ingredients - the higher the concentration the greater the effect or penetration.
- Have an appropriate Ph value (between 4.0 - 8.0) for safe and effective use.



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