10 Healthy Nutrition and Your Skin

I used to get terrible rashes on my arms but I changed my diet and haven't had a breakout since.

—Don, 39, maintenance worker.

Good nutrition is good for you. While few would argue with this statement, most of us don't live by it. Instead we try to thrive by the idea that fast is good, the quick fix is it. Add to this our equal and opposite obsessions with food and weight, and you've got the recipe for unhealthy nutrition.

Ironically, more of us than ever patronize health food stores these days, hopeful that such places are meccas of good health and even cures. The idea that we are what we eat finds special emphasis in dermatology, where a persisting misconception is that "chocolate causes acne." While it is in some ways true that we are what we eat when it comes to heart disease (too many low-density lipids and too much cholesterol are bad, high-density lipids are good), the same is not always true for other conditions and aspects of health. Teasing out the facts about nutrition and skin is especially important in a society where food has become a fetish and good nutrition is expected to heal all.

Would that it were so. But there are many areas in dermatology, in both health and disease, where nutrition plays an important role, largely by contributing to general health.

The skin can hardly be unaffected by what we do to our bodies. Thus, it's clear that nutrition is important to the skin—although not in the ways some readers or vitamin pushers wish it might be. In other words, generally speaking, changes in your dietary habits *cannot* solve your skin woes.

The increasing role of nutrition in health reflects a general interest in macrobiotic diets and the use of diet to control high cholesterol, osteoporosis, and a whole host of conditions. However, many people begin to think what they eat can cure *whatever* they have. It can't. Exceptions to this include specific allergies and diseases that are caused by particular foods and manifest with skin symptoms. In the wide world of skin, while diet can help contribute to its overall health, it usually will not make a difference when it comes to a particular ailment. Take acne, for example—we now know that greasy foods, salt, and chocolate have little impact on whether or not an individual experiences outbreaks of acne.

There are basically three questions to consider when thinking about nutrition and the skin. In what way does the skin itself function in maintaining proper nutrition in the body? What few people know is that there are many processes that occur within the layers of our skin that are distinctly nutritional in nature. Second, under normal circumstances, can changes in diet influence the color, texture, appearance, or nature of our skin? Third, in conditions where the skin is not functioning properly (that is, when certain diseases have developed) can changes in nutrition prove beneficial? The rest of this chapter addresses these three questions.

▪ SWEAT, NUTRIENTS, AND THE SKIN

Under normal circumstances small amounts of nutrients are lost in sweat through the skin and in the horny layer of the skin surface that flakes off on a regular basis.

Human sweat is a weak salt solution, consisting of sodium, chloride, potassium, calcium, and even urea. The actual amount of salt lost in this way from routine sweating is really minimal and of no great significance (a young adult male will lose only 360 mg of nitrogen and 149 mg of calcium in a twenty-four-hour period). Where sweat loss is extreme, there can be enough of a depletion of sodium to produce a life-threatening situation.

This can happen when heavy sweating occurs in very hot environments or during excessive exercise.

Perhaps the most serious circumstance where there is a loss of nutrients through the skin is in burn trauma. The same dangers can occur in a few rare skin conditions, where the body forms blisters that simulate a burn situation. In both these circumstances, there can be massive loss of protein from the serum (the fluid or liquid part of blood). This highlights the fact that when the skin loses its normal barrier function, important compounds can escape from the body, thus creating a precarious situation. In general, however, it is important to realize that under normal circumstances when we sweat there is no significant loss of important nutrients through the skin.

▪ Vitamin D, A Natural Wonder

A most fascinating and unexpected nutritional role of the skin is the one it plays in the metabolism of vitamin D, a very important nutrient for maintaining healthy bones, teeth, and skin.

It was only at the turn of the twentieth century that the role of sunlight came to be understood as important for health. The function of skin in vitamin D metabolism was discovered as a result of a major socioeconomic change that occurred in the preceding century, the Industrial Revolution. This revolution resulted in the mass migration of people from the country to the cities, where dense slums were hastily thrown up to accommodate the teeming population. These new urban immigrants worked long shifts and lived in dark buildings, looking out on sunless alleys. Factory workers received far less sun exposure than had been the case when they lived in the countryside and often worked outdoors.

As early as the 1600s observers noted that young working-class children in crowded areas in London and Manchester developed rickets, but it was the Industrial Revolution that made this disease a household word. Rickets is a bone-deforming condition that makes legs bowed, literally bow-legged. Muscle weakness is a serious symptom of rickets, which can deform other long bones as well. Amazingly, by the beginning of the twentieth century, approximately 90 percent of children living in cities of northern Europe were affected by this disease.

No one was quite sure what the cause was. Some believed it was an inherited disorder, others suggested it was caused by an infection, and still others thought that either a lack of activity or nutritional deficiency could explain it. In 1822, a Polish scientist had suggested that rickets was caused

by the absence of sun, but his theory languished obscurely in scientific journals for about a century. Eventually, in a small experiment in 1921, eight children with rickets were regularly exposed to natural sunlight on the roof of a New York hospital; within several months their condition improved. Around this time other investigators zeroed in on the essential dietary factor, present in cod liver oil, that seemed to fix the problem of bowed bones. Interestingly, artificial light, in the form of the mercury vapor lamp, was able to simulate the effect of this compound and cure rickets in animals. Finally, in the 1930s, the element that was present in foods like cod liver oil and which seemed magically to get activated by the sun was identified: vitamin D.

As it turned out, vitamin D wasn't just vitamin D—it had many different variations. It also became clear that during and immediately after exposure to sun, events happened in human skin that led it to manufacture vitamin D. The complex chemistry of vitamin D wasn't worked out until the 1970s and 1980s: when vitamin D in the skin is exposed to ultraviolet light from the sun, one form of vitamin D promptly converts to other forms of the nutrient. Those other forms of the vitamin get into the circulatory system through blood vessels in the skin and play a critical role in the development and maintenance of healthy bones and teeth. These days, with the heavy supplementation of milk and food with vitamin D, the possibility of a vitamin D deficiency caused by little exposure to the sun is small. Combine a poor diet and no vitamin supplements with a life where the sun is always shut out, however, and the risk of vitamin D deficiency is real.

I need to point out that as far as doses of vitamin D go, this is a prime example of "more may not be better." Some people might think that since a little bit of vitamin D is good for bones, why not take a whole lot more? Or why not stay out in the sun and allow your body to manufacture more vitamin D than it might actually need? The problem is that vitamin D is a fat-soluble vitamin. Fat-soluble nutrients stay in the body for a very long time, building up when too much is ingested. In fact, you could develop toxic levels by taking too much artificial vitamin D supplement.

▪ Can Vitamin A and Its Derivatives Improve Skin?

Another compound that has a close connection with the skin is vitamin A. When it was isolated from egg yolk in 1909, it was originally called fat-soluble factor A and known to be important for the normal growth of

animals. Later, as its critical role in growth, vision, reproduction, and skin maintenance emerged, it was renamed vitamin A. As we now use the term, vitamin A refers to a whole host of compounds, not one specific chemical. Generally speaking, vitamin A derivatives have a counterpart in nature: carotenoids, so called because they are found in carrots, a natural source of vitamin A, as Bugs Bunny has known for a long time. In over-the-counter cosmetics one will often see the word *retinal* or *retinoid,* which refers to the entire group of naturally occurring and even artificially manufactured vitamin A–type compounds.

Vitamin A and its derivatives are extremely important in dermatology. They help treat diseases and they provide cosmetic benefits. Retin-A is a derivative of vitamin A that has been used to treat acne for decades and has become popular as an agent that is proven to reduce fine lines and wrinkles. Renova and Retin-A Micro are two brand names of this compound.

Isotretinoin, known as Accutane, is a vitamin A formulation taken by mouth that has proven extremely helpful in treating cystic acne but has the associated risk of causing birth deformities. Needless to say, no dermatologist or other physician should prescribe isotretinoin without carefully making sure the patient, if of child-bearing age, understands the risks and is willing to use an appropriate form of birth control. Blood lipids can rise when a person is on Accutane—anyone at risk for heart disease should be especially careful.

Very rarely a condition called *pseudotumor cerebri* can develop in those taking isotretinoin; persistent headache with changes in vision occur. The symptoms usually respond promptly when the drug is stopped. Even depression and psychiatric disturbances can occur in very unusual circumstances. Excess intake of vitamin A itself can lead to side effects similar to those of Accutane, including shedding of skin and hair loss. Overall, vitamin A products have been extremely helpful in managing skin diseases and are even more promising in terms of solutions to cosmetic needs of patients.

Vitamin A is stored in the liver and released to the body as needed. Vitamin A works on the skin cell itself in many ways. It may cause a whole range of effects, many of which are beneficial. Specifically, vitamin A derivatives are thought to control cells that might otherwise turn cancerous. Vitamin A compounds are very helpful in treating conditions such as psoriasis, where the skin proliferates very rapidly and thick scaly patches of skin can accumulate.

▪ VITAMIN C

The case for good nutrition as a key component of healthy skin is crystal-clear when we consider what happens when a key nutrient is absent from the diet. For centuries, sailors were subject to scurvy, a condition that produced skin and mouth sores that did not heal. The longer the time at sea, the more men wound up with swollen, discolored limbs, bleeding mouths, and loose teeth; some sailors eventually lost many of their teeth. James Lind (1716–1794), a naval surgeon, suggested supplementing the daily fare fed British sailors—meat, ale, and potatoes—with lemon and orange juice. Lind's idea proved a sound way to prevent scurvy; we now know that it was the absence of vitamin C, found in fresh fruits, that caused the disease. Soon the Royal Navy was issuing its men a daily ration of lemons or limes, which is how the British sailor acquired the nickname of "limey."

Many patients believe that extra vitamin C will help healing. In fact, vitamin C plays an important role in wound healing in normal amounts, but I do not usually recommend taking megadoses of vitamin C to enhance healing. Since vitamin C is water-soluble, what your body doesn't use is excreted in urine.

▪ ZINC AND YOUR SKIN

Minerals are the other micronutrients that are popular in health food culture. Human beings are made up of dozens of minerals. In fact, by weight—not counting the water that we mostly consist of—we would be mainly mineral, rather than animal or vegetable. While the role of many other minerals in growth and maintenance of our bodies is still being investigated, it is known that zinc plays a definite role.

Based largely on what happens in the absence of adequate zinc, it is now popularly believed that large amounts of zinc will assist in hair growth and skin rejuvenation. I must stress that it is not clear that an excess amount of zinc will regrow hair, fortify its strength and durability, or enhance the quality or nature of skin. Zinc has been recommended as an aid in wound healing, but there is conflicting evidence that zinc in amounts greater than normally consumed in the diet enhances healing.

▪ Water and Your Skin

First off, let me say that there is no direct connection between drinking water—or spraying it on your face, for that matter—and healthy skin. There is, however, a relationship between good health and good skin. And adequate hydration is important for good health.

While water cannot "purify" or improve your skin, it does make up the majority of our body weight. It is better to be properly hydrated than dehydrated. As long as your kidneys are functioning well and you take in more water than your body uses in a day, your fluid status should be optimal.

▪ Allergies Related to Food

How often have you heard of someone who, having eaten strawberries, shellfish, or nuts, then developed hives? Perhaps this has even happened to you.

Some people develop hives when they touch certain foods rather than eat them. Individuals often complain of these symptoms in their hands when their work primarily involves working with foods or chemicals that are problematic. This is called *contact urticaria*. If you think you get hives or any other rash after eating certain foods, keep note of them and see your doctor. If you develop difficulty breathing, seek medical attention immediately.

MARGARITAS, SUN, FUN, AND RASH

An unusual but not uncommon skin rash can develop when a compound in limes, figs, and other fruits reacts with ultraviolet radiation from the sun. Interestingly, the rash is often seen on the hands of bartenders at tropical resorts. Limes, which they squeeze all day long, contain a compound called *psoralen,* which is activated by sun and can cause a sunburn or even contact dermatitis.

Psoralen is interesting for another reason. First used centuries ago by the Egyptians, it is currently an important part of therapy for psoriasis patients. They take the compound as a drug that, combined with artificial ultraviolet A radiation, can control the disease.