

## Benefits for the skin

### Atopic Dermatitis

The prevalence of allergic diseases in Europe and the United States has risen in recent years: atopic dermatitis has increased 20-fold in the last 60 years and affects 17-23% of the European and American population.(1) This is related to changes in western diet as a result of industrialisation (one such change is the increase in Omega-6 fatty acids and decrease in EPA and DHA).



In the opinion of some authors, the symptoms of atopic dermatitis are a precursor to developing allergic rhinitis or asthma, suggesting that this condition is the starting point for future allergic disease.(2,3) Up to 80% of children with atopic dermatitis will develop allergic asthma or rhinitis in their lifetime.(1)

There is a causal relationship between high Omega-6 consumption and allergy disease, due to excessive production of arachidonic acid eicosanoids. Fish and fish oils are sources of long-chain Omega-3 and these fatty acids have the opposite effect to Omega-6. Omega-3 oils are thought to provide protection from atopic sensitisation and the clinical symptoms of atopy. Consumption of Omega-3 by the mother during pregnancy protects the child. Most studies also demonstrate a protective action when Omega-3 is consumed by children and adolescents. Consumption of fish oil by the mother during pregnancy is associated with immunological changes in the blood of the umbilical cord and can reduce sensitisation to common allergens as well as the prevalence and severity of atopic dermatitis in the first

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years of life. This effect can continue until adolescence.(4)

A study in which 98 atopic mothers received supplements of long-chain Omega-3 polyunsaturated fatty acids (LC-PUFA) or placebo from 20 weeks of gestation until birth showed that the Omega-3 LC-PUFA supplement modulated the immunological response in atopic dermatitis: the children of mothers who received this supplement showed erythrocyte concentrations of Omega-3 LC-PUFA higher than the control groups. Cytokine concentrations (interleukin (IL) 5, 13 and 10 and interferon- $\gamma$ ) in response to all the allergens tended to be lower in the supplement group (the reduction was only statistically significant for IL-10 in response to cats).(5)

### Psoriasis

Omega-3 LC-PUFA supplements complement topical treatment of psoriasis and contribute significantly to reducing the psoriasis area and severity index and the nail psoriasis severity index, and improve the dermatological life quality index, reducing lesions to the scalp, itching, erythema and desquamation in the area of psoriasis treated, compared to topical treatment without supplement(6).

### Sun Protection

Skin cancer as a group (basal cell carcinoma, squamous cell carcinoma and malignant melanoma) is the most common cancer among white Caucasians and ultraviolet radiation (UVR) is involved in the genesis of all three types. Topical protection is normally badly used (insufficient or uneven application), so a systemic protection method is an attractive option, particularly if it is achieved with a healthy diet. An assessment of the effect of EPA supplements on various early carcinogenesis markers in UVR-induced genotoxicity (in a double-blind, randomised study lasting 3 months, in which

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EPA bioavailability was measured in the skin), showed that solar erythema sensitivity decreased in the EPA supplement group (the threshold of UVR-produced erythema rose significantly compared to the baseline). Furthermore, in this group, UVR-induced p53 expression in epidermal cells decreased significantly when assessed immunohistochemically 24 hours after exposure to UVR. DNA fibre breakage in peripheral blood T-cells also decreased. This all suggests that EPA supplementation can reduce skin cancer in humans in the long term.(7)

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### Bibliography

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