

# About our Preservatives

## **Vitamin E**

Vitamin E plays a crucial role in protecting skin cells and membranes from environmental damage. This protection extends to stopping damage to the skin from UV rays, pollutants and ageing. It provides deep moisturisation for the skin whilst allowing the skin to breathe and function naturally, therefore helping to reduce the appearance of fine lines and wrinkles. In cosmetics, vitamin E is a natural preservative that helps sustain shelf life of products.

## **The Truth about Parabens**

The last few years has seen a noteworthy expansion of the natural skincare products market with a trend leaning towards products that are free of synthetic chemicals such as sodium lauryl/laureth sulphate or SLS, parabens, phthalates, artificial preservatives, over-manufactured and processed products as well as synthetic fragrances often made from petrochemicals. An increasing number of people are concerned about what they put on the skin and worried about the health consequences of such harsh synthetic chemicals which may accumulate in the body.

The long standing controversy over one such chemical is parabens which generated interest (alarm actually!) some years ago when it was linked to cancer with reports of its carcinogenic properties. In particular, was the concern that its presence in anti-perspirant and deodorant products was somehow linked to the onset of breast cancer. Since then, there has been a lot written about parabens especially as a 'chemical nasty' and we should avoid it at all costs. So let's look at this concern and examine the real truth about parabens. Parabens are a class of chemicals widely used as preservatives not only in the beauty and cosmetic industries but also in the food industry. They are effective preservatives (bactericidal and fungicidal) and therefore commonly found in toiletries such as shampoos, shaving gels and body washes as well as in a range of skincare products such as moisturisers, sun creams and make up to keep the products free from harmful microbes. For this reason, they are also found in a range of food products as preservatives (with FDA and EU authorisation) and commonly found labelled as E numbers E218 (methylparaben), E214 (ethylparaben), E216 (propylparaben) and butylparaben. Less common parabens include isobutylparaben, isopropylparaben, benzylparaben and their sodium salts. Quite often, a combination of these and other preservatives are used to broaden the spectrum of their preservative action. All commercially used parabens are synthetically produced, although some are identical (molecular, biochemical and structural) to those found in nature. Parabens are found naturally-occurring in a variety of foods such as blueberries, apples, blackcurrants, carrots, onions, grapes, yeast extract, natural vanilla extract, wine vinegar and cheese; the human body is perfectly capable of processing parabens detected by the presence of their breakdown products in urine. Parabens have a long-established use as

preservatives since the 1920s and have a safety record that's widely accepted by the scientific community.

Given the relative abundance of parabens in nature, it is hard to imagine the fuss over its alleged cancer risk but nevertheless, we need to examine these claims. So where did it all start? A study conducted in 1998 demonstrated that some parabens have mild oestrogenic activity. This means that they mimic oestrogen, an important hormone (in both men and women) that has been previously shown to accelerate the growth of some cancers (in particular, oestrogen-dependent cancers). However, this oestrogenic activity was extremely weak (almost minuscule - to give some idea, it was reported at being 100,000 times weaker than the main and most powerful of the oestrogens: oestradiol). However, the mutagenic effects (trigger for cancerous change) of oestrogen is dependent on free radical chemistry and is not simply a matter of whether an oestrogenic effect (however weak) is exerted so the point of this research is questionable to say the least. However, this initial research led to other studies into this 'carcinogenic effect', notably whether parabens were present in breast cancer tissue in the belief that parabens in anti-perspirants and deodorant products were linked to breast cancer. A 2004 study revealed that traces of parabens were indeed present in breast cancer tissue (in 18 out of 20 samples) but equally, parabens were also found in 9 of their 'blank controls', some of which were in significantly higher quantities than the tissue samples, but later shown to be a contamination of the glassware. We can safely rule out this study as credible as it is incredibly flawed.

It needs to be noted that parabens have never been used in and are not present in approx. 95% of anti-perspirants and deodorants on the market since most are alcohol-based or with an aerosol mechanism which precludes the necessity for further preservative action; alcohol is a potent preservative. Therefore, the link between anti-perspirant & deodorant products and breast cancer is extremely tenuous at best. But nonetheless, the lack of removal of these toiletries from sale only served to consolidate the fear and public concern fuelled by rumour in an email circular, the origins of which are difficult to establish. It is also worth noting that anti-perspirants also contain aluminium-based products and zirconium salts as their active ingredients; studies into whether these ingredients are carcinogenic rather than parabens is currently being considered. The mere action of inhibiting the sweating process by blocking sweat pores under the arm doesn't seem natural and does warrant some investigation at the very least! Sweat is an excretory product of the body containing a number of toxins that are destined to be released from the body, NOT to be reabsorbed back into the blood. Could this be having an impact in breast cancer development?

A more recent study was conducted into detecting the presence of parabens in samples of breast cancer tissue taken from 40 women diagnosed with the disease - the results of which were published in March 2012. One or more paraben esters were detected in 158 of the 160 samples studied (99%) and 96 of the samples (60%) contained all five of the most common esters. Further, the authors noted that there was a disproportionate incidence of breast cancer in the upper quadrant of the breast nearest the armpit with a significantly higher

level of n-propylparaben in the axilla region closest to the armpit (than in the mid regions). The other 4 parabens were equally distributed across all parts of the breast.

A closer look at the data reveals the following:

- drainage route of the axillary lymph nodes travel through the armpit as a first point of contact -any breast cancer tissue will undoubtedly show the presence of substances; the study was only looking for parabens
- sources of the parabens not determined - given the relative abundance of parabens (food, water, environmental oestrogens or xeno-oestrogens and toiletries etc...), it did not establish where they were from
- 9 of the 40 women have never used underarm products - the parabens must have come from elsewhere
- other risk factors in breast cancer - all major breast cancer campaign groups reiterate that this is a multifactorial disease meaning that the causes are attributed to many reasons. The 3 biggest factors are age, gender and family history (genetic). Other equally important factors include diet, lifestyle (eg. smoking), stress , HRT, the contraceptive pill, not having children and environmental oestrogens (xeno-oestrogens)
- study did not demonstrated cause and effect merely the presence of parabens in breast cancer tissue. It did not compare paraben levels in other parts of the body and this study is very small (only 40 women were studied)
- the study did not examine healthy breast tissue (as control or comparators)

Breast cancer charities are right in their condemnation of the manner in which this study was publicised highlighting that this creates further worry and fear about parabens. The point of this research is baffling - looking for parabens in any body tissue tissue is likely to yield positive results given the relative abundance and our exposure to parabens (both natural and synthetic). Identifying the source(s) of the parabens, then establishing cause and effect in addition to using healthy controls is essential. Many people do not understand RISK (which is very different to CAUSE) so making this distinction is paramount whenever conducting research into this.

To date, there is no link or convincing scientific evidence that parabens affect breast cancer risk. Further, there are no strong epidemiological studies in the medical literature that links breast cancer risk with anti-perspirant use, and very little scientific evidence to support the claim. To substantiate this, a carefully designed epidemiological study published in 2002 which compared 813 women with breast cancer and 793 women without the disease showed that there was no link between breast cancer risk and anti-perspirant or deodorant use, or indeed underarm shaving (thought to introduce parabens into the area via open cuts or nicks results from this process). Parabens are safe with FDA approval and EU authorisation for use in internal products (foods and medicines) and external products (toiletries, cosmetics and topical medicines). It needs to be borne in mind that preservatives are necessary as the natural oxidation process of ingredients in a product can quickly go

rancid producing more lethal and toxic substances which can be worse than any imagined risk from parabens. However, there is no doubt that further work is necessary rather than recycling pointless pieces of small-scale research which are poorly constructed and designed - surely this is worse than useless?

So what about alternatives?

- consider discarding the use of anti-perspirants or deodorants if you are worried - but remember to wash regularly if you want to avoid body odour and maintain your social life!
- switch to products which are natural or organic, reading all labels carefully but remember, products without preservatives will go rancid very quickly and may produce toxins which can be more dangerous
- natural preservatives in toiletries can include key essential oils, neem oil, sweet orange oil, vitamin E, honey, grapefruit seed extract and potassium sorbate amongst others.... However, all of them have their limitations despite the claim on 'natural'. For instance, grapefruit seed extract is a natural antibiotic and antiseptic (true) but the process of extraction is done under chemical synthesis involving catalysts and reagents under extreme heat. Some commercial preparations are known to include methylparaben and triclosan and the so-called natural grapefruit seed extract has not been shown to provide any antimicrobial protection whatsoever, rather it's the parabens in it that is preserving the product

So be careful when dismissing parabens - many of the big players in the natural skincare and cosmetic industry extol the virtues of their products being 'free of parabens' like it is something of a claim when in fact, you are likely to encounter a host of other ingredients in them that offer little or no preservative action. All synthetic preservatives have been tested for safety and effectiveness (microbial challenge tests) and are found in a range of products. These include benzylalcohol, tetrasodium EDTA, phenoxyethanol and germall plus amongst others. Be careful when considering ditching parabens and coming to immediate conclusions without weighing up all the evidence. There will always be radical alarmists eager to sensationalise for the sake of making headlines. There are more immediate and paramount concerns such as the quality of the air we breathe and the traces of medicines and drugs (pharmaceutical, industrial and recreational) in our drinking water.