New Horizons in the Development of Natural Oils and Butters as Cosmetic Ingredients - Novel Introduction of Stabilized Omega-3 in Cosmeceuticals

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Abstract

In recent years natural products have grown from a niche segment to one of the fastest-growing categories in personal care. In fact natural personal care (NPC) has outperformed other natural product segments such as functional foods and supplements. The growth of NPC will continue following the growth in the nutraceutical market.

Although all attempts are being made to replace petroleum-based products with natural ones, the substitution is far from complete, owing to the lack of in-depth knowledge of the raw materials as well as product formulations and stability. Application of natural oils and fats were severely restricted due to oxidative degradation of lipids resulting in malodors, color change, viscosity increases, and changes in specific gravity, solubility and appearance. Researchers recently described the development of a unique means of stabilization of exotic butters and natural oils, thus avoiding any cumbersome application of antioxidants and avoiding heating, homogenization, extra labor and handling of additional powders.

While using natural oils and butters, one can use either the properties of triacylglycerol constituents or non-triacylglycerol component or both, as per specific requirement of the product formulation in question.

Skin

The skin is the largest organ of the human body. The approximate surface area of the skin for an adult weighing 65 kg is 1,8 m^2. The skin represents the barrier of the human body that shields it from a variety of strains such as heat, cold, and light including ultraviolet (UV) and other types of harmful irradiation. Other stressing factors which the skin has to cope with are dehydration, noxious substances, insect bites and infection by various microbes. To survive these strains the skin performs a variety of specialized functions and reactions to provide production of melanin, sebum as well as keratinization, sweat-secretion and so on.

Natural lipids may be beneficial for the physical and biochemical properties of the skin. The physical benefits include occlusivity, which, in cosmetic and pharmaceutical practice, refers to the ability of a substance to create a film on the skin surface that interferes with the evaporation of water from the skin surface. Any increase of transepidermal water loss (TEWL) decreases the level of water retained in the epidermis. This is a significant problem in people with atopic eczema, chronic contact eczema, and other forms of dry skin. In the design of cosmetics for the repair of damaged skin and for skin protection, it is, therefore important to assess the effect on transepidermal water loss. In this context it is important to notice that the term moisturization is often preferred because occlusion may imply retention of dirt. In cosmetics natural lipids are thus used as occlusive agents, but promoted as moisturizers.

The biochemical benefits of natural lipids include the regulation of epidermal growth, reduction of skin inflammation and provision of a skin barrier function. The barrier properties of the skin and skin's ability to retard transepidermal water loss depend on the presence of epidermal lipids. The permeability barrier in human skin is mediated by three lipid families - ceramides, free fatty acids and cholesterol - present in an approximately equimolar ratio. The epidermal lipids are formed *de novo* by keratinocytes, although some lipids or their precursors are supplied from the circulatory system. Variations in the composition and proportion of these lipid families can lead to deterioration, normalization or acceleration of barrier repair.

Lipids as cosmeceuticals

The cosmetic industry through intensive research has developed products to cure skin disorders and to retain the skin's natural beauty. Long ago, natural fats were the dominant emollient material, but later these were replaced in many applications by mineral oils. However, because of the growing awareness in the 1980s and 1990s of the environment and an increasing interest in the environment and environmentally friendly products, naturally renewable vegetable lipids are finding an ever-increasing use in a wide range of cosmetic applications.

More systematic studies of a wide range of plant seeds and their oils have identified many interesting materials. Previously unknown oils with unusual properties and chemical structures