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Beauty secrets
From the 80s

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Introduction

We have always desired beauty. Alongside concerns about health and food, significant attention has been given to physical and aesthetic well-being. A person expresses themselves not only through actions and knowledge but also through their appearance. Moreover, caring about appearance reflects a person's level of cultural development.

Caring for health is closely linked to caring for the skin of the face and body. Medical cosmetics focuses on improving a person's appearance.

Taking care of our health is connected to taking care of our skin. Medical cosmetics enhances appearance. The word "cosmetics" comes from the Greek word "cosmeo," which means decoration. Artificial beauty, achieved through makeup, is not true beauty. Real beauty, color, and shape need proper care and hygiene. Medical cosmetics and hygiene go hand in hand, as cosmetic success isn't possible without good hygiene. The beauty of the human body includes both shape and skin. Minor shape flaws can hide beautiful skin, and unhealthy skin can make beautiful shapes hard to see. Medical cosmetics deals with fixing skin issues related to dermatology. Today, medical cosmetics is often called aesthetic medicine. This includes cosmetic, hygienic, and preventive skin care.

History of cosmetics

The art of beauty is over 5,000 years old. As cultures changed, so did cosmetics. In ancient times, cosmetics were important for hygiene and decoration. Even in prehistoric times, people used natural paints and tattoo products.

Cosmetics were popular in ancient Egypt. Modern archaeologists found many recipes for creams, incense and dyes during excavations. These recipes were often carved on temple walls. Egyptians used makeup to highlight eyebrows, lips, and eyes, giving their gaze a deep and expressive look. The famous statue of Queen Nefertiti shows her well-applied makeup. The first lipstick was discovered in Ice Age caves, and the Ebert papyrus contains early cosmetic advice.

Middle Eastern cultures advanced perfumery, and the Greeks adopted many cosmetic practices from Egypt. Greek women used soot and egg white for eyelashes and red lead for lips and cheeks. Cleanliness was important to the Greeks, who used creams and oils after washing. Cosmetic knowledge spread to Rome, where luxury and beauty were highly valued. Roman women bathed in milk and used rose oil and perfumes.

Cosmetic interest declined with the fall of the ancient world but revived in the Middle Ages. Soap was invented in the 9th century, and lavender water and cologne followed. France became a center for the perfume industry in the 16th century, producing perfumes, creams, and powders. French cosmetics peaked in the 18th century, with fancy makeup styles influenced by Italian tastes.

In Russia, women embraced Western cosmetic trends under Peter the Great. Beauty salons appeared in the late 19th century. By the early 20th century, only actresses and certain women used cosmetics, focusing mainly on hairstyles. In the 1960s, cosmetics became popular again.

Today, cosmetics are seen as a scientific field. Medical cosmetics focuses on keeping and restoring appearance through safe, high-quality products. Advances in science have transformed cosmetics, now considered a new medical discipline. Understanding skin structure, reactions, and care is crucial. Cosmetics are divided into medical and decorative categories, with medical cosmetics including surgical procedures for aesthetic purposes.

Modern cosmetology uses advances in medicine, biology, and technology, such as lasers and computers. In Japan, automated systems help women choose the right blush and lipstick for their skin type.

Anatomy, histology and physiological functions of the skin

The skin is the body's outermost layer and acts as a complex organ that manages how the body interacts with the environment. On average, an adult's skin covers 1.5 to 2 square meters and has many folds and grooves, some natural and some that develop with age or due to certain habits. Tiny pores on the skin's surface are openings for oil and sweat glands and are generally not visible. The skin changes to mucous membranes around natural openings, like the mouth, eyes, nose, external genitals, and anus.

The skin has three main layers

1. Epidermis: The outer layer, consists of several sub-layers. The basal layer contains cells that produce melanin, which gives skin its color. The spinous layer has cells with thorn-like projections, while the granular layer contains cells with keratohyalin granules. The outermost layer is the stratum corneum, consists of dead, flattened cells.

2. Dermis: The middle layer, which includes the papillary layer (with its dermal papillae) and the reticular layer. The reticular layer contains dense connective tissue with collagen and elastic fibers that provide strength and stretchiness.

3. Hypodermis: The deepest layer, consisting of fat and connective tissue. This layer stores fat and provides cushioning and insulation.

Skin thickness varies: it is thicker on the palms and soles (up to 1 mm), thinner on the eyelids (around 0.4 mm), and can become much thicker in areas of fat accumulation. The epidermis continually renews itself, with a full turnover happening every month on the soles and every 10 days on the elbows.

The skin's blood vessels, including arteries, veins, and lymph vessels, form networks in the hypodermis and dermis. These vessels are crucial for nutrient delivery and temperature control. The skin also has a rich supply of nerves, which are important for feeling and reacting to different stimuli.

The skin performs several vital functions

- Protection: It guards against physical, chemical, and biological threats. Its barrier functions are supported by the stratum corneum and the skin's water-fat layer.

- Temperature Control: It helps maintain body temperature through blood flow and sweat production.

- Excretion: Sweat and oil glands help remove waste products from the body.

- Breathing: While the skin's role in oxygen exchange is minor compared to the lungs, it still takes part in the process.

- Sensation: It is sensitive to touch, temperature, and pain, which helps the body respond to its environment.

Skin health can reflect overall health, with changes in skin color and texture often indicating underlying medical conditions. The skin also has some ability to absorb chemicals, which is important for the effectiveness of many cosmetic and medicinal treatments.

Overall, the skin is a dynamic and multifunctional organ crucial for protecting the body, regulating temperature, and interacting with the environment.

Anatomy and histology of skin appendages

Hair and Hair Follicles

Hair and hair follicles, along with sebaceous glands, begin developing in the third month of fetal development. During this stage, the three-layered epidermis forms embryonic papillae that extend into the dermis, from which hair follicles differentiate. These follicles are evenly distributed across all races, but their density varies depending on the body part, with four times more follicles found on the scalp compared to the limbs.

In the embryonic phase, the entire body, excluding the mucous membranes, palms, soles, and fingertips, is covered with fine, soft hair known as lanugo. As fetal development progresses, this hair is replaced by other similarly fine hairs. By the time of birth, some areas develop longer and coarser hair, particularly on the scalp, where hair groups form distinct patterns, including one or two curls at the crown.

Post-puberty, fine hair in the armpits, external genitalia, and in men on the face, transforms into longer, terminal hair. Bristly hair, such as that found on the eyelids, eyebrows, nostrils, and external ear canal, also develops after puberty. The growth and development of terminal hair are influenced by hormonal factors, particularly androgens, which become more active after puberty and decline with age. Genetic and racial factors also play a significant role in hair development, with certain groups, like those of Mongoloid descent, exhibiting less hair growth.

Hair varies in thickness, color, and texture, ranging from straight to curly. On average, the scalp contains 580-600 hairs per square centimeter, with diameters varying by hair color—blond hair being the thinnest and red hair the thickest.

Each hair consists of a shaft, root, and bulb. The shaft emerges from the hair follicle, with its free end tapering to a point. The root is embedded within the follicle and terminates at the hair bulb, which houses the hair papilla. Long hair contains three layers: an outer cuticle, a middle cortical layer, and a central medulla. The cuticle comprises overlapping keratinized cells, while the cortex contains elongated cells filled with melanin, which determines hair color. The medulla consists of large, vacuolated cells containing trichohyalin, a substance similar to keratohyalin found in the granular layer of the epidermis.

The hair follicle consists of undifferentiated matrix cells and is located within the dermis, extending into the upper parts of the hypodermis for long hair. The follicle

opens at the skin's surface and includes a smooth muscle attachment, which causes hair to stand erect and compresses the sebaceous glands.

Physiology of Hair Growth

Hair growth occurs in three distinct phases: anagen (growth phase), catagen (regression phase), and telogen (resting phase). In humans, individual hairs undergo these phases independently, while in animals, the phases often occur simultaneously, leading to shedding.

For the longest hair, the anagen phase lasts about three years, the catagen phase lasts 2-3 weeks, and the telogen phase lasts 3-4 months. In healthy individuals, 85% of scalp hair is in the anagen phase, 1% in catagen, and 14% in telogen, resulting in the daily loss of up to 60 hairs. During anagen, hair matrix cells rapidly divide, supported by a good blood supply to the hair papilla. In catagen, cell division ceases, and the follicle undergoes keratinization. Finally, in telogen, the keratinized hair bulb rises, making the hair easily shed during activities like combing.

Hair growth rates vary by body part, with scalp hair growing an average of 0.35 mm per day, eyebrow hair at 0.16 mm, and underarm hair at 0.30 mm. Various factors, including age, health, and even the season, influence hair growth.

The state of hair development can be assessed using a trichogram, a technique that examines the different growth phases by analyzing hair roots under a microscope.

Sebaceous Glands

Sebaceous glands form at the end of the fourth month of fetal development and are connected to hair follicles via short ducts. These glands are absent on mucous membranes, palms, and soles, but they are highly concentrated on the face, sternum, and spine.

Skin oils, produced by these glands, lubricates the skin and hair, protecting them from moisture loss and promoting elasticity. The composition of skin oils varies, containing water, fats, proteins, and other substances. Skin oils production increases during puberty and decreases with age.

Sweat Glands

Sweat glands are simple tubular structures classified into two types: eccrine and apocrine. Eccrine glands, numbering 2-5 million, are found mainly on the palms and soles, while apocrine glands are located in areas with secondary hair growth, such as the armpits and groin.

Eccrine glands are responsible for regulating body temperature through sweat production, with each gland capable of secreting up to 10 liters of sweat per day under certain conditions. Apocrine glands, larger in size, produce a thicker secretion that contributes to body odor.

Nails

Nails begin forming at the end of the third month of fetal development, consisting of a dense keratin plate located in the nail bed. The structure and growth rate of nails vary among individuals and change with age or disease. Nails grow at an average rate of 0.12 mm per day, with the growth rate influenced by factors such as age, health, and even climate.

Features of the Skin and Its Appendages on the Head

The skin's structure varies across different body parts, a factor to consider when prescribing treatment and hygiene measures. For instance, the epidermis on the face and neck regenerates more slowly than on other parts of the body, and this regeneration decreases further with age.

On the scalp, long hairs are grouped and have the deepest follicles compared to other body hairs. The scalp also contains many large sebaceous and sweat glands, with the skin being tightly attached to the underlying aponeurosis, making it less mobile.

Facial skin lacks the smooth muscle fibers that raise hair, instead containing striated muscles involved in facial expressions. The skin of the face, particularly around the eyelids, is rich in capillaries and vellus hair, with the skin around the eyes being exceptionally delicate and prone to swelling due to the arrangement of collagen fibers.

Biochemistry of Skin and Its Appendages

The skin is a complex organ that mediates the body's interaction with the external environment. It engages in various biochemical processes, such as keratinization, water-lipid mantle formation, and melanogenesis, which are crucial for protecting the body from external harm and enhancing the beneficial effects of the environment.

Keratinization

Keratinization is a process unique to the stratified squamous epithelium of the skin. It involves the transformation of filamentous structures, derived from tonofilaments, into keratinized cells, which provide the skin with its protective properties. This process also plays a role in forming the water-lipid mantle, which covers the skin and protects it from moisture loss.

The water-lipid mantle is composed of desquamated keratinized cells, sweat, and skin oils, forming an emulsion that varies depending on the skin's condition and environment. The pH of this mantle is typically acidic, varying with factors such as gender, age, and external conditions.

Melanin and Melanogenesis

Melanin, produced in melanocytes from the amino acid tyrosine, plays a crucial role in protecting the skin from harmful solar radiation. The synthesis of melanin is influenced by various factors, including ultraviolet rays, hormones, and internal conditions. Melanin provides photoprotection by binding harmful substances formed under sunlight exposure. In the absence or low concentration of melanin, the skin is more susceptible to degenerative changes, potentially leading to malignancy.

Cosmetic preparations

Raw materials used in cosmetics

1. Fats (Lipids):

Fats, also known as lipids, are among the most important ingredients used in cosmetics. Traditionally, both animal fats (such as pork fat) and vegetable oils (like palm, olive, and almond oils) have been widely utilized. These fats consist primarily of triglycerides of higher unsaturated fatty acids (oleic, palmitic, stearic), which allow them to penetrate easily into hair follicles and the upper layers of the skin. This makes them ideal bases for nourishing creams and, to a lesser extent, protective creams. However, a downside is that these fats can oxidize quickly, causing them to go rancid. This oxidation, due to the unsaturated nature of the fatty acid triglycerides, produces breakdown products (like aldehydes, ketones, and fatty acids) that can irritate the skin and mucous membranes. Hydrogenating these unsaturated fatty acids can delay rancidity, but it also destroys vitamins D and Pu F. Esters of higher fatty acids with monohydric alcohols (such as isopropyl palmitate, and isopropyl laurate) penetrate the skin easily.

2. Hydrocarbons:

Common hydrocarbons used in cosmetics include petroleum jelly, paraffin, ceresin, and defatted ozokerite. These are often included in creams with protective properties due to their weak ability to penetrate the skin.

- Vaseline: This is a mixture of solid and liquid hydrocarbons obtained from the fractional distillation of petroleum. White Vaseline is commonly used in cosmetics, while yellow Vaseline is mainly used in products with light-protective properties. Artificial petroleum jelly is a mix of paraffin wax, ceresin, and petroleum jelly.

- Paraffin: Derived from oil distillation, paraffin can be either solid or liquid. Solid paraffin, consists of higher fatty hydrocarbons, has a crystalline structure and is colorless, odorless, and tasteless. Liquid paraffin, also known as paraffin oil or Vaseline oil, is an odorless, colorless, and tasteless oily liquid. Mixing solid and liquid paraffin in specific ratios creates a paraffin ointment, similar to Vaseline but less viscous and sticky, and non-irritating to the skin.

- Ceresin: This is refined natural paraffin, used as a sealant without the emulsifying properties of wax.

Paraffin hydrocarbons have greatly impacted the perfumery and cosmetics industry by enabling long-term storage of products and expanding cosmetic production. However, they have some drawbacks. For example, Vaseline remains on the skin’s surface for a long time, clogging pores, trapping heat and moisture, and slowing the excretion of sweat and sebaceous glands. In some cases, this can lead to allergic reactions, making mineral fat derivatives less suitable for completely replacing fatty components in cosmetics.

Cleansing creams containing small amounts of paraffin derivatives also include natural fats to prevent skin dehydration.

3. Natural and Synthetic Waxes:

Waxes are esters of higher fatty acids with monohydric (and less commonly, dihydric) higher alcohols. They also contain free fatty acids, free alcohols, and sterols, most of which are solid and have melting points between 60-70°C.

Natural waxes used in cosmetics include beeswax, spermaceti, cetyl alcohol, lanolin, and stearyl alcohol.

Lanolin

Derived from sheep's wool, lanolin contains cholesterol, isocholesterol, lanosterol, and both free and esterified higher aliphatic alcohols. It's used to increase the skin's fat content. However, lanolin has a distinctive smell, stickiness, and can cause allergic reactions. Lanolin derivatives obtained through acetylation and oxyethylation are much more user-friendly, as they do not trigger allergic reactions. Higher alcohols from lanolin, obtained through hydrolysis, are used in emulsions with a wide pH range.

Spermaceti

Extracted from sperm whale fat, spermaceti is a white, scaly, crystalline mass that feels greasy. It consists of cetyl palmitate, free cetyl alcohol, and small amounts of cetyl esters of fatty acids. When exposed to air, spermaceti darkens and becomes rancid. It is usually mixed with liquid fats and oils to thicken mixtures and give them a dense consistency and easy spreadability.

Cetyl and Stearyl Alcohols

These are produced by saponifying spermaceti and form a white, solid, crystalline mass that melts at 50-59°C. They are hydrophilic and dissolve in fats and hydrocarbons.

Wax

Primarily used as a sealant for fatty oils, liquid paraffin, and Vaseline, wax contains free alcohols (38-40%), esters of higher alcohols from higher fatty acids (such as ceric, neoceric, melicic, and palmitic), hydrocarbons, and small amounts of free acids. Wax can emulsify water due to its higher alcohol content.

Synthetic Waxes

These are materials with a waxy consistency, such as cetiolate and cetyl palmitate, which are similar in composition to natural wax.

Lecithin

Extracted from egg yolks, animal bone marrow, soybeans, and corn, lecithin is included in nourishing creams for its ability to deeply penetrate the skin.

Silicone Waxes and Oils

Silicone waxes and oils are highly stable during storage, resisting saponification and oxidation. They rub easily into the skin, penetrate hair follicles, do not cause irritation, and have low surface tension. Additionally, they do not affect skin temperature regulation, and they form a wide range of consistencies from liquid to semi-solid. Their viscosity remains consistent despite temperature changes, and they mix well with acetyl alcohol, cocoa butter, lauric acid, and more. Chemically, silicone waxes and oils are organosilicon compounds.

Phytosterols

Phytosterols are plant-based analogues of cholesterol, primarily containing sitosterol. Although insoluble in water, phytosterols can retain water, making them effective emulsifiers in cosmetic formulations.

Polyethylene Glycols

These are polymerized derivatives of ethylene oxide with consistencies that vary based on molecular weight, ranging from liquid to solid forms. By mixing polyethylene glycols of different consistencies, ointments with varying viscosities can be created.

Cellulose Derivatives

Methylcellulose and sodium carboxymethylcellulose are used to create gels at concentrations of 1-7%.

Cosmetic emulsions

Fatty (lipid) preparations in cosmetics can be classified into three groups:

- Oils and Fatty Anhydrous Creams
- Oil-in-Water Emulsions: with a continuous aqueous phase
- Water-in-Oil Emulsions: with a continuous oil phase

Oils and Fatty Anhydrous Creams are mixtures of fatty (lipid) substances with additives like spermaceti, cetyl or stearyl alcohol, paraffin, ceresin, or lanolin to achieve the desired consistency. They are used for cleansing and protecting the skin, preparing nourishing creams, and for sunbathing and massage.

Emulsions are coarse systems formed from at least two incompatible liquids, with one dispersed (emulsified) as droplets not exceeding 0.1 microns in diameter. The two main types of emulsions are:

- Oil-in-Water Emulsions: Widely used in cosmetics, they easily penetrate the skin and are often used to deliver biologically active substances. This type of emulsion is found in various cosmetic forms, including beach milk and day, moisturizing, and depilatory creams.
- Water-in-Oil Emulsions: These are used in products like cleansing and restorative cleansing milk, anti-wrinkle creams, and creams for hands and protection against sun damage.

Cosmetic creams

Cosmetic creams are a mixture, often with a high water content, designed to care for the skin on the face, hands, head, and other body parts. These creams are emulsions, which means they are made of two main phases: liquid and oily. In cosmetology, these emulsions are important because they allow fats to be easily absorbed by the skin, producing the desired effects. The water in these creams helps to disperse fats and similar substances, giving the cream a pleasant white color, elasticity, and a smooth consistency. When applied, these creams often create a cooling sensation. Compared to anhydrous products, emulsified creams have several advantages: they are easy to apply, maintain a consistent texture regardless of temperature, and have an appealing appearance.

Cold Creams

Cold creams, also known as cooling creams, were first introduced by Galen in the 16th century and are still made following his basic recipes. Modern cold creams are emulsions, either oil-in-water or water-in-oil, with a complex composition. The consistency, which can be thick or liquid, depends on the amount of wax used. Cold creams have a soft texture, are easy to apply, and are effective at cleansing the skin.

Cleansing cold creams typically contain mostly mineral oils. When using cold creams for cleansing, apply a thick layer and remove it with paper towels or a similar material. For nourishing the skin, cold creams are applied in a thin layer and left on for a longer period; these creams often contain high-quality vegetable oils.

Approximate composition of cold creams:

1. First Recipe:
   - Citaceum: 15 g
   - White wax: 8 g
   - Soybean oil: 62 g
   - Distilled water: 15 g
   - Lavender oil: 0.5 g
2. Second Recipe:
   - Citaceum: 8 g
   - Beeswax: 7 g
   - Almond oil: 60 g
   - Distilled water: 25 g
   - Rose oil: 2 drops

Nourishing Creams

Nourishing creams, often used at night, are designed to soften and hydrate the skin. These creams are particularly good at penetrating the lower layers of the epidermis. It was once believed that fat was the key to preventing skin from drying out and aging. However, it is now understood that maintaining normal skin function requires not only skin oils but also water-soluble substances within it. The combined effect of fats and the water phase in creams benefits the skin.

Scientific studies have shown that the skin's elasticity and flexibility depend on its ability to retain water, particularly in the stratum corneum. Dry skin is usually caused by a lack of water, with healthy skin requiring at least 10% water content. The ability of the skin to bind water is determined by the presence of water-soluble substances, which act as natural moisturizing factors. Young skin contains enough of these substances, but as we age, the stratum corneum loses its ability to retain water, making the use of hydrating products necessary to prevent water loss from the skin's surface. These products help the stratum corneum retain moisture, contributing to softer skin.

Increased hydration can be achieved through osmotic or physiological mechanisms. Hydrating agents include sodium lactate, pyrrolidine-carbolic acid, amino acid and sugar derivatives, proteins, and mucopolysaccharides.

The mechanism of action of hydrating creams

- Blocking: Creams create a barrier that prevents the stratum corneum from losing water, helping it accumulate moisture.
- Saturation: The stratum corneum absorbs water from the cream, which cannot be achieved by simply washing the face, as the skin's ability to absorb water from the outside is minimal.

The most typical nourishing cream is an oil-in-water emulsion with a high oil content. These emulsions contain up to 55% water and 1-2% beeswax. The aqueous phase often includes magnesium sulfate.

Examples of nourishing creams

Softening Cream

1. First Recipe:
- Citaceum: 1 g
- Beeswax: 4 g
- Olive oil: 18.75 g
- Lanolin: 37.5 g

2. Second Recipe:
- Borax: 0.25 g
- Water: 37.5 g
- Olive oil: 25 g
- Perfume composition (fragrance): 0.5 g

Night Cream

1. First recipe:
- Paraffin: 14 g
- Beeswax: 11 g
- White Vaseline: 6 g
- Ozokerite: 1 g
- Lanolin alcohol: 0.3 g
- Stearindiglycol: 0.3 g

2. Second recipe:
- Mineral oil: 41.2 g
- Water: 25 g
- Borax: 0.7 g
- Perfume composition: 0.5 g
- Preservative: 0.5 g

Hydrating (moisturizing) creams are often used as night creams

Day Creams include matte creams and emulsions that tone the face.

1. Matte Creams: These are oil-in-water emulsions that include fats, oils, and water. They have a soft, fluffy consistency that absorbs quickly into the skin, leaving a thin, invisible layer that gives the skin a matte appearance, reduces shine, and protects it from environmental factors.

2. Face Toning Creams: These creams primarily consist of powder and makeup, giving the skin a beautiful appearance. They often contain stearic acid and different emulsifiers like potassium or sodium hydroxide, or potassium or sodium carbonate. Glycerin, up to 10%, is commonly added for hygroscopic properties, but too much glycerin can dry the skin, so it is often replaced with propylene glycol. These creams typically contain color additives ranging from 3% to 25%. When the dye content exceeds 10%, the cream is known as cream powder.

3. Sports Creams: These should not be sticky, should spread easily on the skin, should not be too greasy or absorb too quickly, and should provide a protective layer without hindering skin respiration.

4. Protective Creams: These are essential due to the rise in occupational skin diseases and the widespread use of household chemicals. Protective creams are categorized into two groups:

- Creams that protect against the harmful effects of water and water-soluble chemicals.
- Creams that protect against the harmful effects of fatty substances and various chemicals dissolved in them.

Requirements for protective creams

- They should not cause irritation or sensitization.
- They should be easy to apply, covering the skin with a non-sticky, elastic, easily removable film.

Vaseline is the most suitable protective cream against water. To reduce its stickiness and improve the skin’s thermal regulation, zinc oxide is added.

Creams containing silicone, in concentrations of 1-8%, protect against the effects of hard water and detergents on the skin. Dimethylpolysiloxane and methylphenyl polysiloxane are used as fillers in these creams.

Protective creams against fats contain hydrophilic substances that are insoluble in organic solvents, such as triethanolamine, sodium alginate, methylcellulose, and cellulose derivatives.

Cleansing milk

Cleansing milk is a popular modern cosmetic, available as a liquid emulsion in either water-in-oil or oil-in-water form. Unlike creams, cleansing milk contains more water and fewer solids, giving it a lighter texture. This makes it easy to apply to the skin. The same emulsifiers used in creams, such as potassium and sodium hydroxides or carbonates, are also used to make cleansing milk. For an especially good emulsion, ammonium salts like triethanolamine stearate are effective.

Over time, cleansing milk tends to thicken, which increases its viscosity. A simpler composition generally makes the product more stable. It's important to keep glycerin and other mucous substances to a minimum, as too much can make the milk sticky. The ingredients in cleansing milk are chosen based on its intended use, whether for cleansing or nourishing the skin. It’s widely used because it applies easily, softens the skin, and serves as a good base for products like sunscreens and toners.

Masks

Face masks are designed to enhance the appearance of the skin by offering cleansing, stimulating, softening, and tightening effects. The composition of masks varies depending on their intended purpose. There are five main types of masks based on consistency:

1. Paste Masks: Made with ingredients like bentonite, salicylic acid, talc, and bodyagi.
2. Liquid Masks: Based on hydrocolloids like albumin, latex, and casein, containing up to 5% solids.
3. Gel Masks: Contain hydrocolloids with a high concentration of solids.
4. Wax Masks: Primarily consist of solid paraffin, wax, petroleum jelly, or microcrystalline wax.
5. Powder Masks: Applied after being mixed with a liquid phase.

Paste Masks

Paste masks contain a high percentage of solids like kaolin or bentonite dispersed in a liquid. Mud and kaolin compresses fall under this category. These masks are left on the face for 10-15 minutes until the water evaporates and the mask hardens. However, it’s important not to let the mask harden completely, as this can make it difficult to remove. To help retain moisture, ingredients like glycerin, sorbitol, and propylene glycol are added.

Liquid Masks

Liquid masks have a low viscosity, making them easy to apply and quick to dry, which is why they are often preferred over paste masks. They mostly consist of hydrophilic colloids such as gelatin, egg white, gum Arabic, cellulose, and polyvinylpyrrolidone.

The liquid phase is usually water or a water-alcohol mix. Latex-based masks, which form a uniform elastic film that acts as a heat insulator, are the most common type. This increases moisture retention in the skin, raises skin temperature, dilates blood vessels, and improves circulation. However, liquid masks tend to have a weaker cleansing effect compared to paste masks due to their lower solid content.

Gel Masks

Gel masks are similar to liquid masks but have a thicker consistency. They are often used to reduce wrinkles and contain either natural or synthetic hydrocolloids.

Wax Masks

Wax masks include waxes, paraffin, lanolin, and similar substances. They work similarly to latex masks by increasing blood circulation and encouraging sweating, which helps remove impurities from the skin. The mask is melted before application, applied to the face, and left to harden. This process helps remove blackheads and cleanse the skin.

Powder Masks

Powder masks are mixed with a liquid before application.

For wrinkle treatment, preparations made with beef fat are sometimes recommended. These are applied in a thin layer for 6-8 hours. They form a thin film that physically fills in skin folds, masking wrinkles. However, this effect only lasts until the mask is washed off and is considered harmless.

Gels

Gels are the jelly-like form found in masks, creams, shampoos, and other products. They are colloidal systems made from at least two components: a solid and a liquid, or two liquids. Gels have a consistency that offers good adhesion and elasticity, and they possess a strength similar to solid substances. They are monolithic systems due to their fine dispersion, meaning the solid phase is dispersed in the liquid without forming precipitates. This stability is achieved by adjusting temperature, pH, and adding electrolytes.

Substances that Form Gels in Water

Natural Substances:

- Algae-derived: Agar-agar, alginates from specific algae, and carrageenan polysaccharides from Icelandic lichen.
- Plant-derived: Starch, gum Arabic.
- Animal-derived: Gelatin.

Semi-synthetic Products:

- These include cellulose, a glucose polymer. The main cellulose derivatives used in cosmetics for forming gels are microcrystalline cellulose, carboxymethylcellulose, methylcellulose, and ethylcellulose.

Mineral Products:

- Thin-layer clays that can retain water.
- Bentonite: An aluminosilicate with traces of alkali metals and iron.
- Veegum: A complex salt of silicic acid containing aluminum and magnesium.

Synthetic Products:

- Carbopol: A carboxyacrylic derivative.
- Propylene Glycol: Ethoxylated.
- Ethanol amidated Fats .
- Glycerin Esters and Higher Alcohols .

Carbopol is a high molecular weight carboxyacrylic or carboxyvinyl polymer. It is a fine powder that disperses easily in water. To increase its viscosity, a thickener is added or it is neutralized. Neutralized Carbopol solutions become highly viscous gels that are easy to incorporate into emulsions. Carbopol should be stored in airtight containers due to their high hygroscopicity. Unlike natural latex, Carbopol have stable properties. They absorb water well, but to prevent granule formation, they should be added slowly to cold water while stirring quickly. Carbopol dispersions are acidic with a pH of 3.0. To increase their viscosity, they are neutralized with ammonia, caustic potassium, or triethanolamine. The most common types are Carbopol 934, 940, and 941. Carbopol 934 is used for making high-viscosity gels, emulsions, and suspensions. Carbopol 940 is used for gels, while Carbopol 941 is used for low-viscosity emulsions (liquid 0.1-0.25% gels) and more viscous gels (0.5-2%).

Gels are very important in cosmetics. Gel-forming substances, or thickeners, soften the skin well but can dry out quickly. To prevent this, glycerin and other hygroscopic substances are added to gels. Due to their large molecular weight, gel-like products only have a superficial effect on the skin and do not penetrate deeply.

Deodorant

Deodorants are used to prevent unpleasant body odor, which is caused by the breakdown of sweat under the influence of microbes. To eliminate unwanted sweat odor, the following methods are commonly employed:

✓ Using substances that reduce sweating.
✓ Deodorizing sweat with bactericidal agents without necessarily reducing sweat production.

Most deodorants typically combine both bactericidal and anti-sweat properties.

Anti-sweating Products

This category includes substances that tighten the skin by causing proteins on the surface of cells to precipitate. The astringent effect of these deodorants results in the contraction and wrinkling of the skin, which narrows the openings of the sweat glands and thereby reduces sweating. The most commonly used compounds are aluminum and zinc salts. Aluminum salts, in particular, have an antiseptic effect and can reduce sweating by up to 40%. However, their effectiveness tends to decrease over time, as sweat can diminish the potency of the product. Repeated use of aluminum salts can increase both the duration and intensity of their action.

Using acetate (vinegar) to reduce sweating is less convenient due to its effectiveness only in acidic environments, coupled with the strong and unpleasant odor of acetic acid.

Anti-sweat deodorants also often contain inorganic and organic zinc salts, such as zinc oxide, borate, and phenol sulfate.

Formalin, known for its contracting and bactericidal effects, should not be overlooked. However, salts of silver and iron are currently not used due to their tendency to irritate the skin and stain clothing. Mercury, chromium, and tin salts are also avoided because of their toxicity and significant systemic effects on the body.

There is a general consensus that artificially suppressing sweating is harmful, as sweating is a crucial mechanism for removing metabolic byproducts from the body. Therefore, regular use of deodorants is not recommended. The most natural method for controlling body odor is maintaining good hygiene by washing regularly and changing underwear.

Bactericidal Agents

Bactericidal agents are used to eliminate bacteria and fungi that break down sweat. These agents typically have both antibacterial and antifungal properties. Chlorinated

diphenols are commonly used as bactericidal components in deodorants. Among the antibacterial agents, hexachlorophene and bithionol are most frequently used. However, bithionol is less favored due to its sensitivity to light. Hexachlorophene is more effective in soapy water solutions than in oil because it does not dissolve well in oil, which limits its contact with the skin.

Ion exchange resins also have deodorizing properties by preventing the breakdown of amino acids in sweat and adsorbing the organic acids formed during this process. Sulfurized compounds such as zinc dimethyl dithiocarbonate and tetramethylthiuramid sulfite are also used as deodorants.

While antibiotics like gramicidin, neomycin, and streptomycin are highly effective as deodorants, their use is discouraged due to the risk of developing antibiotic resistance and the secondary importance of their deodorizing effects.

Alcohols are also effective deodorants, with the most commonly used being 60% ethyl alcohol, 50% isopropyl alcohol, and 30-36% propyl alcohol. However, their disinfecting power decreases at higher or lower concentrations.

Shampoo

Shampoos are modern hair cleansing products that have become a staple in daily life. They should have the following qualities to ensure high performance:

✓ Effectively clean the hair without over-drying it.
✓ Produce a rich lather.
✓ Do not cause irritation to the skin or eyes.
✓ Allow wet hair to be easily combed and leave it soft and manageable after drying.
✓ Prevent static electricity.
✓ Provide a light and pleasant fragrance.
✓ Maintain their physical and chemical properties over time, including stable pH, viscosity, packaging integrity, and resistance to darkening, especially in light-colored shampoos.

Shampoos are available in various forms, including transparent, pearlescent, viscous, liquid, and special-purpose varieties. They are also formulated for different hair types: normal, dry, or oily.

Composition of Shampoos

All shampoos contain cleansing agents, conditioning agents, consistency regulators, preservatives, foam stabilizers, and biologically active substances.

Cleansing Agents

Cleansing agents are the most critical component of shampoos, responsible for cleaning and rinsing the hair. Modern shampoos no longer contain soaps or fatty acids; instead, they use surfactants (surface-active agents) for cleansing. These surfactants include anionic, cationic, amphoteric, and nonionic substances. Anionic surfactants, such as fatty alcohol ether sulfates and fatty alcohol sulfates, are the most commonly used.

Conditioning Agents

To prevent hair from becoming dry during prolonged washing, shampoos include conditioning hydrophobic agents like polyvinyl chloride, isopropyl myristate, and olive oil. However, these agents can reduce foaming and cleaning efficiency. Some modern conditioning agents, such as soluble lanolin ethoxylates, lecithin derivatives, alkylamides, and protein hydrolysates, do not have these drawbacks.

Consistency Regulators

Consistency regulators help maintain the desired liquid consistency of shampoos. Sodium chloride is most commonly used to thicken shampoos, particularly those containing alkyl ether sulfates, which are the main ingredients in many shampoos. Plant gels and cellulose derivatives are less suitable for this purpose.

Foam Stabilizers

Foam stabilizers, such as alkylamides (particularly lauryl) or derivatives of coconut fatty acids, are added to shampoos to enhance foaming.

Biologically Active Shampoos

This category includes protein, vitamin, and anti-dandruff shampoos.

Protein Shampoos

Protein shampoos are designed for oily hair. They help reduce skin oils production and make the hair soft and flexible. These shampoos often contain extracts from plants such as chamomile, nettle, birch, coltsfoot, sage, horsetail, and willow bark.

Vitamin Shampoos

Vitamin shampoos are formulated for dry, delicate hair. They usually contain a complex of B vitamins, inositol, and vitamin F (which consists of unsaturated esters of linoleic and linolenic acids).

Anti-Dandruff Shampoos

Anti-dandruff shampoos are an important category of hair care products. Since dandruff is believed to be caused by bacterial growth on the scalp, these shampoos often contain antimicrobial and antifungal agents such as undecylenic acid, resorcinol, tellurium oxide, mono- and diethanolamine derivatives, hexachlorophene, and quaternary ammonium compounds. Besides their bactericidal properties, these shampoos also have a keratoplasty effect, thanks to ingredients like salicylic acid and sulfur. They also reduce skin oils production, with vitamin B often included to enhance this effect.

Toothpaste

Toothpastes can be categorized into two main types:

Toothpastes for General Use

These are designed for daily oral hygiene, helping to maintain the cleanliness of the teeth and mouth. They do not contain any special medicinal properties but provide a pleasant smell, whiteness, and freshness to the teeth.

Cosmetic Toothpastes

These contain active ingredients that offer both preventive and therapeutic benefits.

Composition of Toothpastes

Toothpastes are made of several components including cleansing agents, foaming agents, astringents, moisturizers, flavorings, colorings, sweeteners, preservatives, and activators.

Cleansers (Detergents, Abrasives)

Cleansers are the most important ingredients in toothpastes as they help remove plaque and other substances from the surface of the teeth. Toothpastes typically contain 35-55% cleansing agents. These agents should have a pleasant scent, effective cleaning properties, and be water-soluble to prevent buildup between the teeth. Common

abrasives include calcium carbonate, magnesium carbonate, silicic acid, and various phosphates. While whitening, binding, and swelling agents are added to protect tooth enamel, excessive amounts can reduce the effectiveness of the cleaning agents.

Surface-Active Cleansing Agents (Surfactants)

Surfactants not only help in cleaning but also contribute to the foaming action of the toothpaste, reduce saliva's surface tension, and help the paste penetrate between the teeth.

Astringents

Astringents are added to increase the viscosity of the toothpaste. Hydrophilic colloids such as carboxymethylcellulose, methylcellulose, tyloses, alginates, and carrageenan are used for this purpose, typically up to 2%.

Moisturizing Agents

Moisturizers like glycerin, sorbitol, and propylene glycol are included to retain moisture, ensuring the toothpaste maintains a consistent texture.

Flavoring Agents

Flavoring agents give the toothpaste a pleasant taste, usually using aromatic essences like mint, cinnamon, raspberry, strawberry, and eucalyptus, comprising 1-1.5% of the formula.

Sweeteners

Sweeteners are added to counteract the bitter and astringent taste of some cleansers. Saccharin and sodium cyclamate are commonly used, with only about 0.1% needed for pastes based on phosphates.

Coloring Agents

Coloring agents give the toothpaste an appealing appearance, using food-grade dyes like chlorophyll, carmine and erythrosine

Preservatives

Preservatives prevent microbial growth in toothpaste, which can thrive in the moisture-rich environment created by other ingredients. Effective preservatives include ethyl, methyl, and propyl esters of Para hydroxybenzoic acid.