

# Skin Aura: The Impact of Moisturizers on Maintaining Skin Hydration

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## ABSTRACT

Skin health depends on maintaining appropriate skin hydration, and moisturizers are widely acknowledged as a crucial component of this. However, further research is needed to determine the precise mechanisms by which moisturizers work as well as the different elements that affect their effectiveness. Through an analysis of the functions of key chemicals such as humectants, occlusives, and emollients and how they combine to prevent transepidermal water loss (TEWL), this study aims to understand the role moisturizers play in improving skin hydration. Glycerin and hyaluronic acid are examples of humectants that draw moisture to the skin, and petroleum jelly and other occlusives create a barrier to keep that moisture in. Emollients, like ceramides, fill in the spaces between skin cells to soften and smooth the skin. Experiments evaluating the efficacy of these components on four distinct skin types—normal, oily, dry, and combination—show that occlusives work best on dry skin, whereas humectant-based lighter formulations work best on oily with combo skin. Moreover, it has been discovered that the effectiveness of the moisturizers is greatly impacted by environmental variables including humidity levels and application frequency. Using a combination of humectants, occlusives, and emollients in moisturizers has been shown to have a synergistic impact, improving skin hydration by up to 60% after two weeks of daily use, according to both clinical trials and in vivo tests. These results underscore the value of customized skin care regimens and advance the creation of moisturizing products with greater efficacy.

## INTRODUCTION

Moisturizers are essential for preserving the proper balance of hydration, which is a major factor in the health and look of human skin. In addition to feeling and looking healthier, hydrated skin is more resilient to damage, aging, and environmental stresses. Even though moisturizers are used by many people, research is still being done to determine the exact mechanisms by which they work and how different skin types react to different formulas. Improving skin care routines and the efficacy of moisturizing solutions require an understanding of these mechanisms and how they relate to unique skin features. With the help of this research-based project, which offers a web-based platform that offers customized skin care treatments, dermatological science and technological innovation will be combined. Using facial scanning technology, the platform determines each user's skin type—normal,

oily, dry, or combination—and then customizes recommendations to meet their specific moisture needs. With the integration of AI and real-time skin analysis, the platform provides a tailored moisturizing method supported by several dermatological research.

Our skincare approach is based on a profound comprehension of the occlusives, emollients, and humectants that are essential to skin hydration. All these constituents have distinct functions in preserving moisture levels in the skin, impeding trans epidermal water loss (TEWL), and endorsing general skin well-being. Humectants are chemicals that draw moisture into the stratum corneum, the outermost layer of skin, from the environment or from deeper layers of the skin. Examples of these compounds are glycerin and hyaluronic acid. Occlusives, such as petroleum jelly, create a hydrophobic barrier on the

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**KEYWORDS:** *Moisturizers, skin hydration, humectants, occlusives, emollients, skincare, dermatology*

skin to stop moisture loss. Like ceramides, emollients work to fill in the voids left by skin cells, smoothing and softening the skin while strengthening its structural integrity. Studies assessing these ingredients' efficacy on a range of skin types have revealed that specific skin issues respond better to certain formulations. For instance, milder formulations with humectants work best for oily and mixed skin types, where moisture is still present but may need more balancing. On dry skin, occlusives work better because moisture loss is the main problem. This emphasizes how customized skincare products are essential because a one-size-fits-all approach to moisturizing fails to take into account the variety of skin types and their unique needs for moisture.

Further evidence from clinical trials and in vivo experiments indicates that the synergistic effect of mixing humectants, occlusives, and emollients can improve skin moisture by as much as 60% after two weeks of continuous use. Humectants bring moisture in, occlusives lock it in, and emollients maintain a smooth and healthy skin surface, resulting in a synergistic strategy that increases the overall efficacy

of moisturizers by targeting several aspects of skin hydration simultaneously.

The platform equips consumers with a straightforward, user-friendly interface in addition to scientific improvements. Users can use facial scanning technology to fine-tune their skin analysis after providing answers to a few questions regarding their skin type. Then, using these essential moisturizing ingredients, the system creates a comprehensive, scientifically supported skincare routine. By providing an optimized skincare experience that surpasses traditional recommendations, this personalized solution guarantees that customers receive the best advice possible, specifically matched to their own skin issues and environmental circumstances. The project's conclusion emphasizes the significance of comprehending the biological underpinnings of skin hydration and the part customized care may play in enhancing skincare results. This platform offers a novel approach to skincare by fusing scientific principles with contemporary technology. It overcomes the drawbacks of conventional skincare techniques and provides a more efficient, customized solution for keeping skin moisturized and healthy.

Type	What it does	Who it's for	Common Ingredients
<b>Humectants</b>	Pull water into the skin	Oily or combination skin	Glycerin, hyaluronic acid, sorbitol, urea, aloe vera
<b>Emollients</b>	Restores the skin barrier to soften skin texture	Dry skin or skin with fine lines and wrinkles	Lipids and oils, colloidal oatmeal, shea butter, isopropyl palmitate
<b>Occlusives</b>	Create a barrier over the skin to trap moisture	Super dry or damaged skin	Waxes (carnauba and beeswax), silicone, oils (olive and soybean), dimethicone, lanolin, mineral oil, white

## Dry Skin: Overview, Problems, and Solutions

### Dry Skin

When the skin doesn't have enough lipids (natural oils) and moisture, it becomes dry, flaky, and occasionally irritated. This condition is known as xerosis, or dry skin.

Hydration maintenance is the responsibility of the stratum corneum, the skin's outermost layer. Dryness results from the skin's decreased capacity to hold onto moisture when this layer is disturbed by internal or external sources. Dry skin is frequently caused by harsh cleansers, aging, heredity, low humidity, cold temperatures, and specific medical disorders. Rough texture, stiffness, and itching are common symptoms

of dry skin, particularly after cleansing. Everyone can get dry skin, but older folks are more likely to experience it because skin loses its innate ability to retain moisture as we age.

### Issues Related to Sensitive Skin

1. **Texture: Rough and flaky** Rough patches that peel or flake are a common sign of dry skin. There is an accumulation of dead skin cells on the surface as a result of the skin's inability to shed them due to dehydration. The face, arms, and legs are the areas most affected by this, with noticeable dry, rough, and scaly patches.
2. **Itchiness and Irritability:** Dry skin might become more sensitive and irritable as a

3. result of the compromised skin barrier. Itching can aggravate pruritus, a common problem that can occasionally result in tiny rips or abrasions. When this irritation gets worse, it can cause inflammation and skin disorders like eczema.
4. Splitting and leaking blood Particularly in the areas surrounding the hands, feet, and lips, severe cases of dryness may cause the skin to break. As bacteria can enter the skin's deeper layers through these fissures, they not only make you uncomfortable but also raise your chance of getting infections. With such extreme dryness, bleeding and pain are common.
5. Early Aging Fine lines and wrinkles may occur earlier than they otherwise would due to chronic dryness. The suppleness of the skin decreases with dehydration, increasing the likelihood of obvious aging indications. This is especially evident around the mouth and eyes, where small lines may eventually become more prominent.
6. Elevated Sensitivity When exposed to harsh soaps, perfumes, and environmental elements, dry skin may react more strongly. It is more sensitive to irritants, which can cause it to become red, sting, or experience other types of discomfort.

### Solutions for Dry Skin

A regular skincare regimen that emphasizes hydration, skin barrier restoration, and the use of mild, non-irritating products is necessary to manage dry skin.

1. Dry Skin Moisturizers Addressing dry skin requires moisturization. Long-lasting hydration and support for skin barrier restoration characterize the best moisturizers for dry skin. Products that assist draw water into the skin, smooth the surface, and stop moisture loss should contain occlusives, emollients, and humectants.

#### Essential Components:

Deep hydration is ensured by hyaluronic acid, a potent humectant that can retain up to 1,000 times its weight in water.

Another humectant that draws moisture to the skin's surface is glycerin.

Ceramides: Lipids that help replenish the skin's moisture-retaining capacity and repair the skin's barrier function.

2. Light Cleaning It's critical to stay away from cleansers that deplete the skin of its natural oils since they might make dryness worse. Choose gentle, fragrance-free cleansers that remove dirt without compromising the skin's barrier integrity.

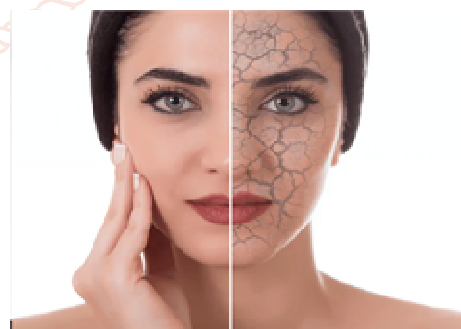
#### Suggestions:

Use cleansers without sulfates that are moisturizing. Steer clear of hot water since it can remove the skin's natural oils.

3. Complete Items People with extremely dry skin must use occlusive preparations, such as petroleum jelly or lanolin. By creating a barrier that eps moisture in and water loss out of the skin, these treatments protect the skin.
4. Creams for Barrier Repairing Creams for barrier repair can aid in restoring the skin's natural defenses. Ceramides, cholesterol, and fatty acids are commonly found in these creams, which aid in the restoration of the skin's lipid layer and enhance its ability to retain moisture.
5. Removers and humidifiers Particularly in colder regions or throughout the winter, low humidity can exacerbate dry skin. By adding moisture to the air, a humidifier aids in the skin's ability to stay hydrated. For people with dry skin, running a humidifier in the living and sleeping spaces can be quite beneficial, especially at night.

#### Result

With the right skincare routine and environmental changes, dry skin—while painful and frequently frustrating—can be effectively controlled. People can improve the overall texture of their skin and restore its natural moisture balance by using moderate, moisturizing products and avoiding potential irritants. Long-term smoother, more resilient skin can be achieved by reducing the symptoms of dry skin with a combination of moisturizers, mild cleansers,



### Oily Skin Overview, Issues, and Remedies

#### An Overview of Sebum Producing Organs :

A common skin condition known as oily skin is caused by an excess of sebum, a natural oil produced by the sebaceous glands that keeps the skin hydrated and shields it from the elements. On the other hand, excessive sebum production can cause a greasy, glossy complexion in addition to a number of other skin-related problems. People with oily skin frequently observe that, especially in the T-zone (the forehead, nose, and chin), their skin gets shinier



during the day. Although this skin type is mostly inherited, it can also be affected by hormones, stress, the environment, and using the wrong skincare products.

### Issues Related to Oily Skin:

Breakouts and Acne is one of the most prevalent issues linked to greasy skin. Excess oil clogs pores by combining with dirt and dead skin cells to cause acne. Different forms of acne, such as blackheads, whiteheads, pimples, and even cystic acne, can arise from these clogged pores. Bacteria can flourish in the environment created by trapped oil in the pores, which can result in infection and inflammation.

### Important Causes of Acne:

1. excess oil produced by sebaceous glands that are overactive.
2. accumulation of dead skin cells and oil clogging pores. Propionibacterium acnes bacterial development inside the blocked pores.
3. These elements work together to cause acne that is visible, which is one of the main issues for people with oily skin.

**Bigger Pores** Another typical problem with oily skin is enlarged pores. The pores expand in an attempt to remove extra oil when sebaceous glands create too much of it. When clogged with debris, oil, and dead skin cells, enlarged pores can stand out even more. In addition, makeup tends to settle into these huge pores, highlighting them, and can give the appearance of uneven and rough skin.

**Glamorous, Greasy Look** Shiny or greasy skin has an oily appearance that can be especially bothersome during the day. Individuals with oily skin types may notice that, particularly in hot or muggy weather, their skin appears moisturized and fresh in the morning but turns greasy by lunchtime or even earlier.

**Dermatitis seborrheica** Seborrheic dermatitis is a skin disorder that is frequently associated with oily skin, especially on the scalp and in places where the production of oil is higher, including the face and chest. It itches and leaves skin in regions that are red, scaly, and flaky. Chronic conditions like this one tend to get worse under stress, with hormone swings and environmental variables playing a role. Excess sebum in oily skin areas interacts with yeast (*Malassezia*) on the skin, causing an inflammatory response that can result in seborrheic dermatitis.

### Remedies for Greasy Skin:

1. Taking care of oily skin involves changing one's lifestyle, using the right skincare products, and occasionally receiving medical attention. Several effective ways to help manage oily skin are listed below.

2. **Mild Cleaning** While cleaning is necessary to control oily skin, it's crucial to stay away from harsh or too drying cleansers that can deplete the skin of its natural oils. Sebaceous glands that have been too cleaned may create extra oil to make up for the moisture they have lost. To get rid of extra oil, grime, and pollutants without weakening the skin's barrier, use a gentle, sulfate-free foamy cleanser.

### Suggested actions:

3. Use a mild, non-irritating cleanser to clean your skin twice a day, in the morning and at night. Seek for components that can penetrate and unclog pores, such as salicylic acid. Stay away from alcohol-based Products
4. **Products Free of Oil and Not Comedogenic** With oily skin, it's imperative to use skincare and makeup products branded as "oil-free" and "non-comedogenic". The purpose of non-comedogenic products is to prevent pore clogging, which can lessen the chance of acne breakouts. Comparably, oil-free cosmetics reduce shine without clogging the face with more oil.

### Product Types to Steer Clear of:

5. thick, greasy-feeling creams and lotions. cosmetic items or thick foundations that could block pores.

### Suggested Components:

6. Niacinamide (for controlling sebum secretion). Natural antimicrobial tea tree oil (which helps lessen acne).

**Oily Skin Moisturizers** In spite of common perception, moisturizing is still necessary for oily skin to stay balanced. If you don't apply a moisturizer, your skin may become dry and produce too much oil to make up for it.

### Top Moisturizing Products:

7. humectants like as glycerin or hyaluronic acid found in gel- or water-based moisturizers. moisturizers without added oil that are non-comedogenic and oil-free.

**Peeling off** Frequent exfoliation prevents clogged pores, a frequent problem with oily skin, and aids in the removal of dead skin cell accumulation. Because they dissolve oil and debris deep within the pores, exfoliants containing beta hydroxy acids (BHAs), such as salicylic acid, are especially beneficial for oily skin types.

### Advice for Exfoliation:

8. Based on how sensitive your skin is, exfoliate two to three times a week.

Hard physical exfoliants (such as scrubs with big particles) should be avoided since they can cause skin irritation.

To improve skin texture and prevent acne, look for chemical exfoliants such as glycolic acid.

9. **Topical Remedies** Topical medications with active components like salicylic acid, retinoids, or benzoyl peroxide can help those with acne brought on by oily skin. These components help treat acne, exfoliate the skin, and lower oil production.

#### **Usual Topical Care:**

**Benzoyl Peroxide:** Diminishes microorganisms that cause acne and reduces oil production.

**Salicylic Acid:** This acid reduces acne by exfoliating the skin and unclogging pores.

**Retinoids:** Encourages cell division and keeps pores from getting clogged.

**Health Care Procedures** Medical measures may be required in cases that are more severe. Treatments recommended by dermatologists include:

In severe situations, oral drugs such as isotretinoin can lower oil output.

Salicylic or glycolic acid is used in chemical peels to thoroughly exfoliate skin and unclog pores.

Oil production can be gradually decreased by using laser therapy to target sebaceous glands.

#### **Result:**

1. **Decreased Acne and Breakouts:** Scrubbing frequently, using non-comedogenic products, and preventing pore clogging result in less acne and cleaner skin.
2. **Less Shine and Grease:** To regulate excess oil and give the skin a more matte, balanced look, use oil-free products, blotting sheets, and clay masks.
3. **Smaller Pores:** Exfoliants and clay masks used in deep cleansing minimize the appearance of enlarged pores, leaving skin looking smoother.
4. **Improved Skin Texture:** Skin texture seems more balanced and healthy when it is regularly exfoliated and moisturized with light moisturizers.
5. **Controlled Seborrheic Dermatitis:** By controlling oil production, seborrheic dermatitis flare-ups are less common, resulting in fewer scaly, itchy patches.



**Fig: Oily skin**

#### **Combination skin Causes, Problems, Solutions, Results and Impact**

Combination skin type is characterized by having different skin conditions in different areas of the face. Typically, the T-zone (forehead, nose, and chin) is oily, while the cheeks and other areas can be dry or normal. This skin type can lead to challenges such as oily shine, acne breakouts in the T-zone, and dryness or flakiness in other areas. Managing combination skin involves using targeted skincare products that address both oiliness and dryness. With proper care, such as using gentle cleansers and balanced moisturizers, individuals can achieve a more even and healthy complexion.

#### **Causes of Combination Skin Type**

- **Genetics:** One of the primary causes of combination skin is genetics. Some individuals inherit this skin type, where different parts of the face have varying oil production levels.
- **Hormonal Imbalances:** Fluctuations in hormone levels (e.g., during puberty, pregnancy, or menstruation) can cause changes in sebum production, leading to oily areas in some parts of the face and dryness in others.
- **Environmental Factors:** Changes in weather or climate can influence skin conditions. In humid conditions, certain areas like the T-zone (forehead, nose, chin) may become oilier, while the cheeks may remain dry in cooler or drier weather.
- **Improper Skincare:** Using the wrong skincare products—those that are too harsh or not suitable for combination skin—can strip moisture from dry areas while increasing oiliness in others.
- **Diet:** A diet high in fatty or processed foods can contribute to oil production in the skin, leading to imbalanced skin conditions.

#### **Problems Associated with Combination Skin**

- **Oily T-Zone:** The most common problem is having an oily T-zone (forehead, nose, and chin)

while other areas of the face (cheeks, jawline) are dry or normal.

- Acne Breakouts: Oily areas tend to be more prone to acne and clogged pores, especially around the T-zone. This can result in blackheads, whiteheads, and inflamed pimples.
- Dryness and Flakiness: The dry areas, often the cheeks and sides of the face, may become flaky, irritated, or sensitive, especially when harsh products are applied.
- Difficulty Finding Suitable Products: People with combination skin often struggle to find products that work for both oily and dry areas. Products that target oil control may be too drying for the cheeks, while moisturizing products may exacerbate oiliness in the T-zone.
- Uneven Skin Texture: Combination skin can lead to inconsistent texture, with some areas feeling rough or dry while others feel greasy or bumpy.

### Solutions for Combination Skin

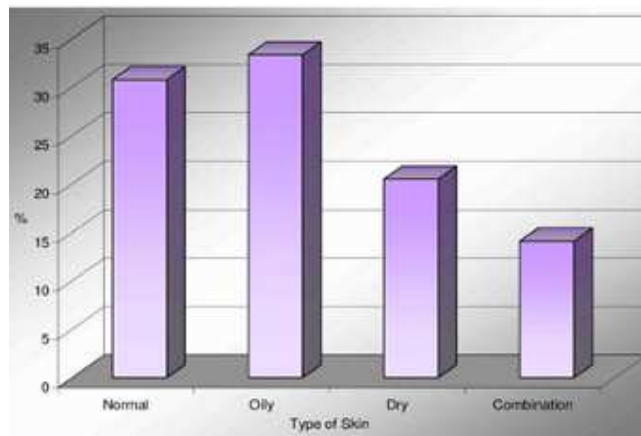
- Gentle Cleansing: Using a mild, pH-balanced cleanser twice a day can help control oil production in the T-zone without stripping moisture from the dry areas.
- Multi-Masking: This approach involves using different masks for different areas of the face. A clay mask can be applied to the oily areas, while a hydrating mask can be used on the dry parts.
- Moisturizing with Balance: A lightweight, non-comedogenic moisturizer should be applied to the entire face. Gel-based moisturizers work well for oily areas, while creamier formulas can be added to dry patches.
- Targeted Treatments: Spot treatments for acne in oily areas (such as salicylic acid or benzoyl peroxide) can be used alongside hydrating serums (like hyaluronic acid) in dry areas.
- Sunscreen: A broad-spectrum, oil-free sunscreen should be used daily to protect both oily and dry areas from UV damage.
- Exfoliation: Regular exfoliation (1-2 times a week) with a gentle exfoliant can help remove dead skin cells from the dry areas and prevent clogged pores in the oily zones.
- Balanced Diet and Hydration: Reducing high-fat, sugary foods, and maintaining hydration can improve overall skin condition, reducing excessive oiliness while maintaining moisture.



**Fig: Combination skin**

### Results and Impact

- Improved Skin Balance: With the right combination of products and treatments, combination skin can achieve a more balanced state, reducing the disparity between dry and oily areas.
- Reduction in Acne and Dryness: Targeted skincare routines can help reduce acne breakouts in oily areas while soothing and hydrating the dry zones.
- Enhanced Texture and Appearance: Proper hydration and exfoliation lead to smoother, more even skin texture, enhancing the overall appearance.
- Long-Term Skin Health: Consistent use of balanced skincare (moisturizers, sunscreens, and cleansers) can improve the health of combination skin over time, reducing the severity of both oiliness and dryness.
- Personalized Skincare Approach: Individuals with combination skin often learn to adopt a personalized skincare routine that treats different areas of the face according to their specific needs, improving the overall effectiveness of their skincare regimen.



**Fig: Graph of types of skin**



## Conclusion

Managing dry skin requires a focus on hydration and moisture. Regular use of rich moisturizers and gentle, non-stripping cleansers helps alleviate dryness and flakiness. Additionally, incorporating hydrating serums and avoiding harsh ingredients can improve skin comfort and elasticity. Addressing environmental factors, such as dry air, also plays a critical role in maintaining healthy, hydrated skin.

Oily skin management involves controlling excess sebum and preventing acne. Using oil-free, non-comedogenic products helps reduce shine and minimize clogged pores. Regular exfoliation and the application of mattifying treatments can balance oil production and maintain a clearer complexion. Adopting a consistent skincare routine tailored to oily skin can effectively address these concerns.

Combination skin requires a balanced approach to address both oily and dry areas. Employing products that target oil control in the T-zone while providing hydration to drier areas helps manage this skin type effectively. Multi-masking and personalized treatments can address the specific needs of different facial zones. A thoughtful skincare routine ensures a more even and healthy appearance.

By tailoring skincare routines to the unique needs of dry, oily, and combination skin, individuals can achieve a balanced, healthy complexion and enhance overall skin well-being.

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