

PERSONAL CLEANSING RESEARCH UPDATE

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CONTACT INFORMATION

To talk with a P&G scientist or to learn about ongoing research at P&G Beauty, contact:

Lauren Thaman Hodges
P&G Beauty Science
513-626-1370

Anne FitzSimons-Unger
MS&L Public Relations
614-933-8577



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INTRODUCTION

As well as providing the basis for beauty, effective cleansing can actually improve the condition of skin, enhance its overall health and keep it younger looking.

The surface of the skin is covered with an intricate pattern of grooves and pores. These grooves and pores provide a perfect environment for dirt and bacteria to collect, which can impair the health and appearance of skin as well as negatively impact the performance of products applied on the skin.

It does not take long for clean skin to become dirty again. Sweat and sebum are constantly being produced and the natural skin renewal process leaves dead skin cells and other debris on the surface of the skin. Add to these natural processes external materials such as dust and atmospheric pollution — as well as cosmetics used for enhancement — and it is easy to understand the importance of regular, thorough cleansing.

These residues not only mar the appearance of the skin; they can also interfere with the absorption of beneficial moisturizing ingredients. Effective cleansing therefore improves both the look and quality of the skin. The poor practices of over-cleansing or under-cleansing can disturb the natural balance of the skin. Harsh products remove skin's natural oils and harm its moisture barrier, causing it to become dry.

Most people fail to realize that water alone is damaging to the skin, especially the warm water that is used while showering. Warm water (avg. 104° F) removes

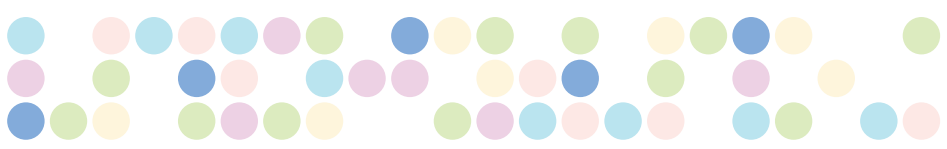
natural oils from the skin, which can result in dryness and irritation. Hot water and long showers or baths remove even more oil than warm water. Soaps and other products used to cleanse the skin further this damage, creating the need for innovation in personal cleansing products.¹

Today, there are many different types of body washes and facial cleansers available that cater to a variety of skin types and personal preferences. At the same time, the cleansing experience has moved beyond one of sustaining basic hygiene and a ritual for relaxation to be a part of an overall skin care regimen, not only to help improve the way skin looks and feels, but improve skin's overall health.

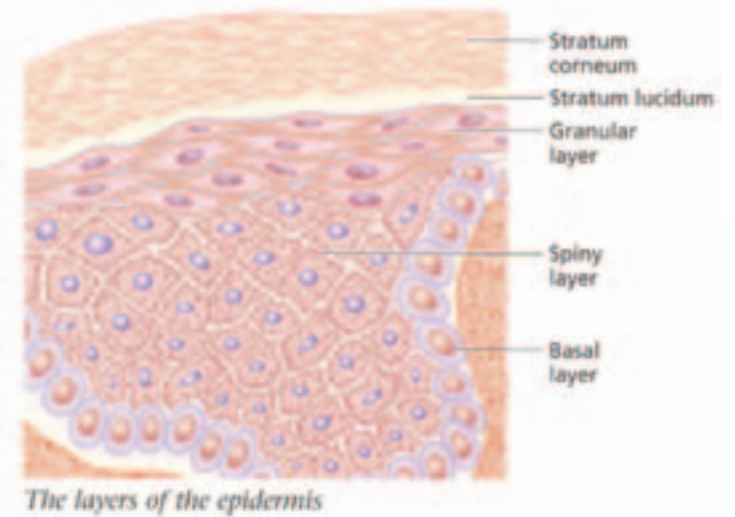
Cleansing & Skin Biology

The primary goal of cleansing is to remove surface dirt and makeup, dead skin cells and bacteria. When skin looks and feels healthy, it can enhance a person's confidence and self-esteem. But to stay healthy, skin must be adequately hydrated with an intact stratum corneum.

The stratum corneum, the tough, outer layer of the epidermis, consists of 15-20 layers of cells called *corneocytes*, held together by protein-rich bridges called *desmosomes*. The spaces between corneocytes are filled with epidermal lipids, or fats. These lipids are key to protecting the skin from environmental insults such as dust and germs. Lipids also maintain the elastic properties of skin cells to help keep skin supple.



One must consider the unique needs of their skin when selecting a cleanser, and avoid products that may compromise the stratum corneum or which exacerbate existing skin conditions. Some consumers choose cleansing products that are touted as “pH balanced,” because of the belief that they are gentler on the skin. However, some scientific literature suggests that pH level is not strongly linked to a skin cleanser’s irritancy potential. One researcher postulated that a product’s ability to minimize surface oil or cause keratin denaturation has a greater impact on its potential to damage skin than its pH.² Likewise, cleansing products that deliver skin conditioners and moisturizers can positively improve the health of skin.



Source: “The World of Skin Care,” by John Gray

ADVANCES IN SCIENCE

Syndets (synthetic detergent soaps) or beauty bars often incorporate moisturizing and conditioning agents, as well as fragrances, water, thickeners, preservatives, and other ingredients. Lipid-containing cleansers have been shown to improve skin’s ability to remain healthy in spite of pollutants and other insults in addition to providing effective cleansing and moisturizing to the skin. In fact, many dermatologists consider petrolatum to be the most effective moisturizing ingredient for treating dry skin.³

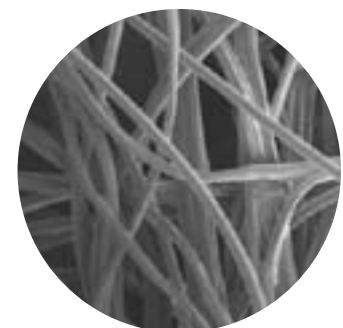
Implements such as puffs that increase lather, and disposable facial cleansing cloths which supply convenient cleansing, have also been introduced to the market and provide the consumer with a better overall cleansing experience and enhanced ingredient delivery.



Facial Cleansing...

For the optimal care of facial skin, a few basic products that cleanse, exfoliate, moisturize, tone, and protect are needed. A good cleanser is one that will clean and moisturize the skin while also helping to exfoliate without being harsh or abrasive. Products with such qualities should be soap-free and may contain beta or alpha hydroxy acids.⁴

Using a patented technology, P&G Beauty researchers developed a disposable lathering cleansing cloth infused with a facial cleanser and skin conditioning agent. The result is an advanced facial cleansing product that leaves skin feeling clean and smooth, without dryness, tightness or stickiness, and is a pleasure to use, therefore improving compliance. A gentle surfactant system, coupled with the intricate architecture of the cloth’s substrate, provides gentle exfoliation as it lifts makeup (including waterproof mascara), dirt, and oils off the skin and locks them in the cloth’s fibers. After rinsing, the skin conditioning agent works to improve the stratum corneum lipid bilayer and create a smoother, healthier skin surface. A facial cloth is particularly convenient for women on the run, frequent flyers, and at the gym, and can be stored and used in the shower for even greater convenience.



Scanning electron microscope images show the fibers of a clean cleansing cloth (top), and a cloth after cleansing (bottom), whereby the fibers have trapped and retained makeup and dirt from the skin.⁵





...What Works

According to research, there are a variety of facial cleansing regimens that can be used to effectively cleanse and condition, including:

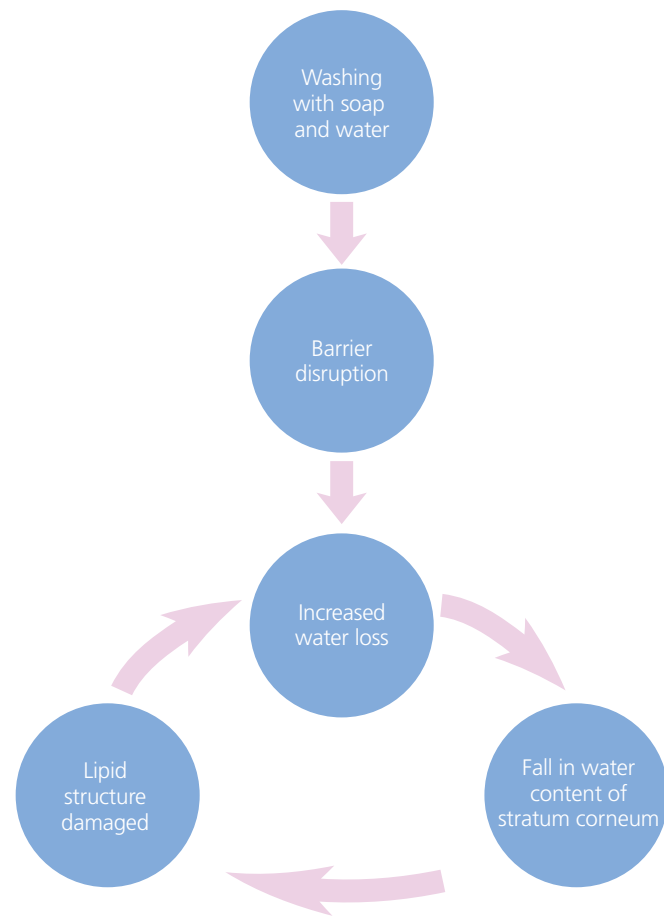
- **Foaming Cleansers** — 100% soap-free and oil-free facial cleansers work well to thoroughly cleanse the skin without overdrying. Most are designed to remove dirt, oil and makeup, and some have special ingredients such as a dual hydroxy complex to fight blemishes and reveal newer skin.
- **Facial Scrubs** — comprised of skin-smoothing microbeads and skin cleansers to exfoliate and deep clean. Applied with the fingers and rinsed off, scrubs remove dead cells and dirt through gentle exfoliation.
- **Facial cleansing cloths** — work to cleanse, tone, exfoliate and condition skin in one step. Variety of formulas available to match the needs of individual skin types.⁶

Body Cleansing...

What is the most common cause of dry skin? Soap and water. It sounds too simple, but it is true. The most common reason people have itchy, rough, uncomfortable skin is the damage done by soap and water. For this reason, it is important to carefully select the cleanser to be used on the body.

The first cleansers developed for the body were bar soaps that produced excellent cleansing, but were quite drying, especially for people already bothered by dry skin. This led to the development of beauty bars, which provide excellent cleansing, but are not quite moisturizing enough for dry skin.

Another force driving development of the new-generation moisturizing body washes is the sheer magnitude of dry skin problems, which affect all ethnic groups and ages around the world.⁷ Psychosocially, dry skin reduces skin beauty and self-confidence because it accentuates other skin flaws and is often accompanied by a compromised skin barrier.



Incidence of Skin Problems Among Women with vs. without Dry Skin

Body Condition	Women with Dry Skin (percent)	Women without Dry Skin (percent)
Wrinkles	50	31
Sensitive skin	47	31
Flaky skin	35	7
Dull skin without a healthy glow	30	13
Uneven skin color	23	12
Rough skin texture	26	5

P&G Beauty worldwide survey results, 2002-2004

Surveys show that more than half of female consumers who wash with soap, syndet or beauty bars must apply moisturizing lotion afterward to counteract their drying side effects.^{8,9} This may be an additional post-cleansing step that women skip due to time and convenience. However, by not repairing the damaged stratum corneum, they can unknowingly set up a cycle of irritation and dryness. This cycle can be interrupted by using a gentle cleansing product with a moisturizing ingredient to replenish epidermal lipids.

Thanks to their cleansing power, aroma, and capacity to generate a luxurious lather, body washes have been growing in consumer popularity. Body washes represent an improvement in the cleansing experience in that they can provide cleansing and moisturization in one step. Body washes are best used with a specially-designed body cleansing puff. The puff allows water and air to mix with the liquid cleanser, which can then be applied to the entire body. Dirt is removed by the body wash and rinsed down the drain while skin conditioners remain behind to provide moisturization.¹⁰

Studies on leg skin show that application of a petrolatum based moisturizing body wash with a puff leaves the skin smoother than hand application.¹¹ One possible explanation is that the puff provides mild exfoliation without damaging the skin. There also may be an indirect effect resulting from more efficient lather generation. Unlike washcloths, puffs quickly mix a small dab of cleanser with air and water to produce a generous and aromatic lather and invigorating washing experience that consumers have come to expect from body washes.



...What Works

Today's moisturizing body washes deposit a high level of lipids to protect and beautify the skin. For example, petrolatum — a commonly used lipid — has the ability to aid in the restoration of the barrier function of the stratum corneum, therefore improving skin's overall health. It is this barrier that is defective in dry skin. Petrolatum-containing body washes are especially important to people with dry skin to restore the skin barrier while providing hygienic cleansing. They can also be used by persons with normal skin who wish to maintain skin's health.¹²



Treating Skin Conditions

Stratum corneum lipid structure reflects skin health and is impacted by age, environmental insults, skin condition, and cosmetic treatments such as personal cleansers.

The petrolatum-delivering body wash ameliorates dry skin appearance and can help to improve or maintain skin health through its effect on stratum corneum lipids. The benefit of a petrolatum-depositing body wash over a syndet or beauty bar plus lotion can be seen across age groups, with varying degrees of dry skin, as the following images indicate.¹³

Age 22, Moderately Dry Skin



Control
Intercellular regions are filled with amorphous material and some Landmann units.



Body Wash
The intercellular lipid structure improves after using the body wash, with more Landmann units visible. Dry skin appearance also improves.

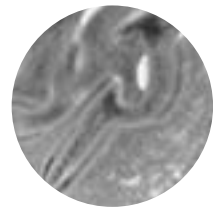


Syndet Bar + Lotion
The bar regimen has little effect on lipid ultrastructure and abnormal lamellae are frequently seen. However, dry skin appearance improves.

Age 28, Severely Dry Skin



Control
Intercellular regions are filled with amorphous lipid material. Landmann units are absent.



Body Wash
Landmann units are restored after using the body wash. Dry skin appearance also improves.

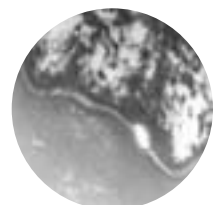


Syndet Bar + Lotion
The bar regimen produces disorganized lamellae with few Landmann units, although dry skin appearance improves.

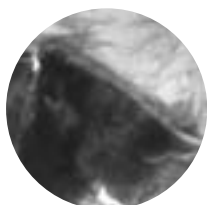
Age 48, Moderately Dry Skin



Control
Intercellular regions with frequent lamellae are present, though Landmann units are generally absent.



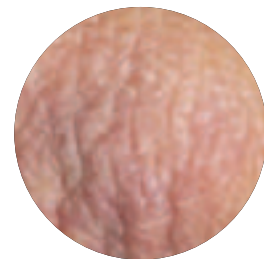
Body Wash
The body wash preserves the existing lipid ultrastructure and improves dry skin appearance.



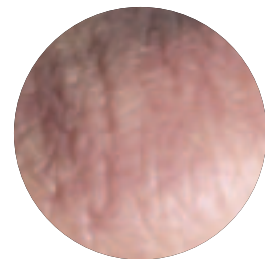
Syndet Bar + Lotion
The bar regimen further degrades the lipid ultrastructure. Fibrous material and disorganized lamellae are present, although dry skin appearance improves.

Dry Skin on Knees and Elbows

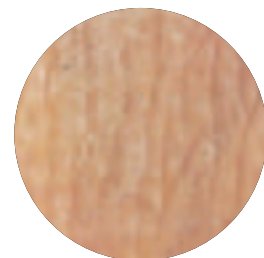
Lipid-depositing body wash significantly improves dry knee and elbow skin, which may become cracked and painful over time without treatment.¹⁴



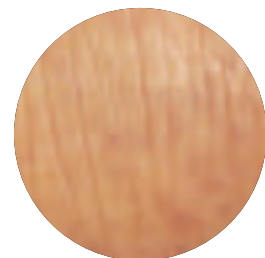
Elbow Skin Before



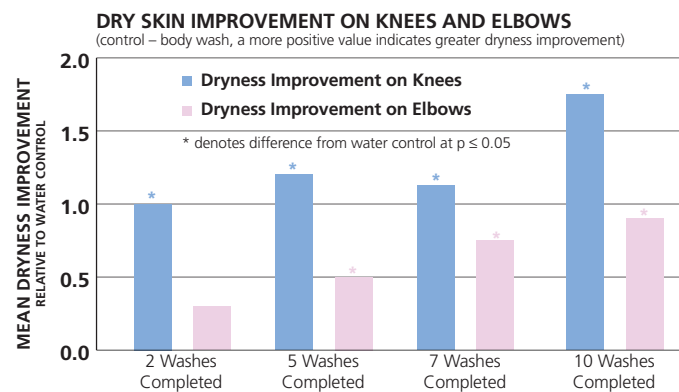
Elbow Skin After



Knee Skin Before

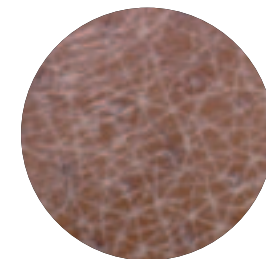


Knee Skin After



Ashy, Dry African American Skin

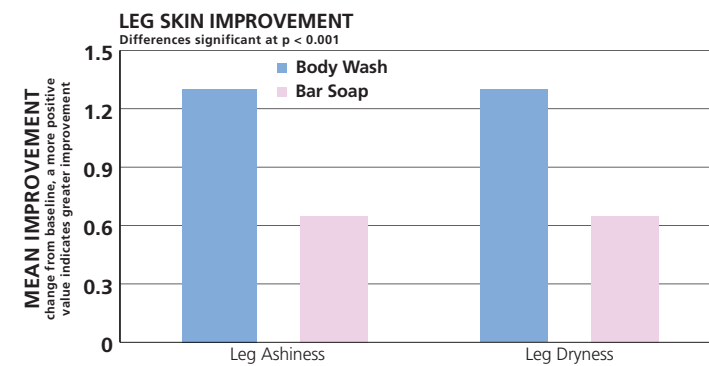
In clinical testing, leg washing with petrolatum-depositing body wash reduced visible dryness and improved stratum corneum hydration significantly better than a leading syndet bar. After using the body wash, subjects reported less skin ashiness and dryness, increased softness and smoothness, and that skin looked and felt like no additional moisturizer was needed.¹⁵



Leg Skin Before



Leg Skin After

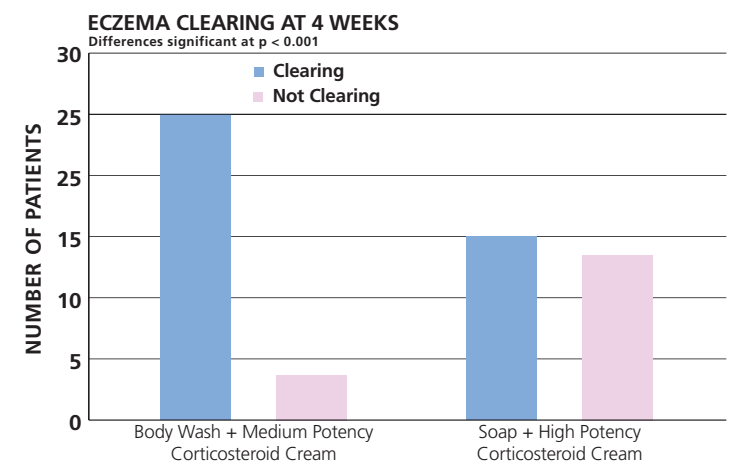


Psychosocially, after using the moisturizing body wash for 4 weeks, all subjects strongly agreed or agreed with the following statements:

- 78 percent felt good about themselves, based on appearance of skin on legs (vs. 33 percent for the control group)
- 83 percent were satisfied with the appearance of their leg skin (vs. 29 percent for the control group)
- 78 percent were confident in letting others see their legs (vs. 33 percent for the control group)

Eczema

A clinical study shows significantly more patients who used a petrolatum-depositing body wash for dry skin, in conjunction with a medium-potency topical corticosteroid, showed improvement and clearing of their eczema compared with patients using a high-potency topical corticosteroid and leading syndet bar.¹⁶



84 PERCENT OF WOMEN AROUND THE WORLD SAY THAT THE IDEAL CLEANSING PRODUCT WOULD MOISTURIZE THEIR SKIN.

P&G Beauty worldwide survey results, 2002-2004

LAB NOTES

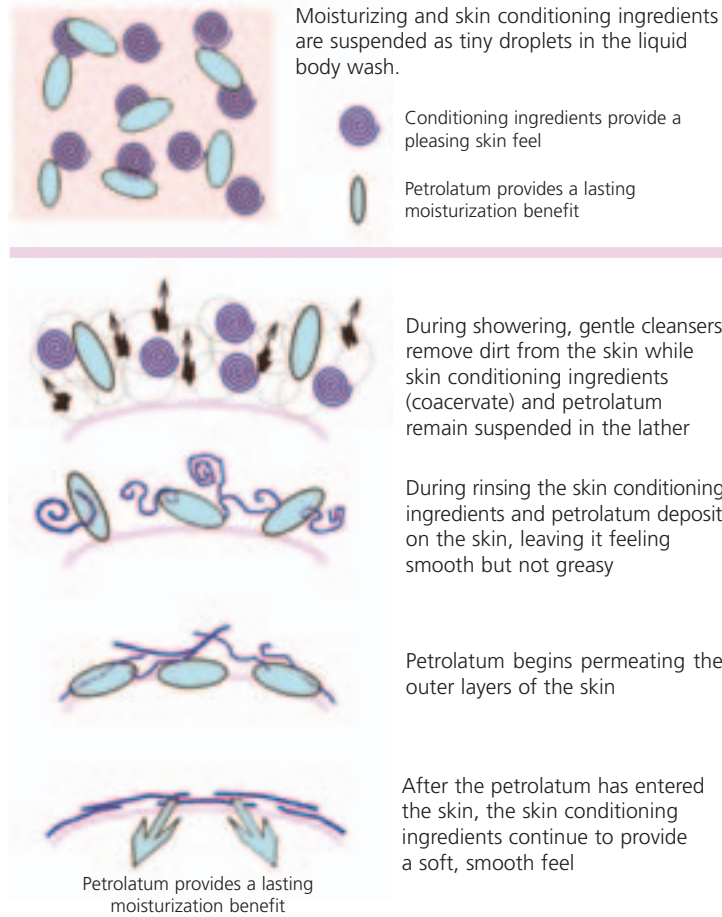
The Search for the Optimal Cleanser

The evolution of cleansers from simply cleaning dirt and oil, to mitigating irritation, to providing skin health benefits, represents a paradigm shift in thinking that is largely unrealized by consumers and dermatologists.

The key challenge in developing these revolutionary new products was enhancing the *deposition efficiency* of the benefit agents, such as skin-enhancing lipids. Some advanced skin-cleansing products employ coacervate technology to efficiently deposit moisturizer after the cleansing and exfoliating process has been completed. Coacervates are precipitated polymer/surfactant complexes capable of entrapping lipids and other benefit agents. This technology allows dirt to be washed away, while the moisturizing benefits of lipids remain for up to 24 hours, leaving a soft, smooth skin feel. (See diagram to right)¹⁷

Recent studies have shown that petrolatum aids barrier repair and can speed healing of damaged skin. The therapeutic effect makes a petrolatum-based cleanser a potential adjunct to treatment for skin conditions such as eczema and chronic dry skin. People with normal skin who bathe frequently or who experience seasonal dry skin can also benefit from using a petrolatum-based moisturizing body wash.

Body Wash for Dry Skin In-Use Performance Model



Special Needs of Aging Skin

As skin ages, less and less of the skin's natural moisturizing factors are produced, causing it to become increasingly drier over time. In addition, the desquamation rate slows down, the network of collagen and elastin which support the skin degrades, and the production of the natural pigment melanin can become uneven.

VISIBLE SIGNS OF AGING SKIN:

- Lines and wrinkles
- Uneven texture
- Uneven tone
- A dull appearance
- Age spots and blotches
- Visible pores
- Overall increase in dryness

Increased dryness is one of the most significant changes skin undergoes as it ages. The hormonal changes that accompany aging can accentuate this phenomenon. Mature skin tends to be dry and tight, with a rough, wrinkled texture and a dull appearance. This can be attributed to a reduction in the water content of the uppermost layer of the skin, a decrease in intercellular lipids, and a decrease in sebum secretion, all of which are needed for skin to stay soft, supple and smooth.

Consumer research carried out by P&G Beauty has shown that mature women consider their skin's primary need to be moisturization. Indeed, many women find that when they reach menopause the moisturizer that they have used for years is no longer enough, and that skin can still feel dry and tight after cleansing. Mature skin has a greater need for good daily skin care, including gentle cleansing with a soap-free cleanser comprised of a mild surfactant system, designed to minimize irritation and over-drying.

Since personal cleansing products are frequently identified as a potential cause of skin drying, good "skin compatibility" (i.e., a low potential to dry skin) is an important consideration when recommending a personal cleanser for a susceptible population.

Studies of elderly women show that moisturizing body washes provide improved skin compatibility and a greater ability to reduce dryness compared to a soap, syndet or beauty bar.¹⁸ In addition, a body wash like the petrolatum-depositing body wash can provide a significant skin health improvement benefit. A population that is susceptible to developing dry skin, such as the elderly, can benefit from using such a product.

What Consumers Want in a Cleanser

In addition to therapeutic moisturizing of the skin, new-generation facial and body cleansers offer other important attributes consumers look for in a cleansing product.

Profiles of the Ideal Cleansing Product

Body Skin Ideal	Percent Consider Important
Is good for my skin	86
Makes my skin soft and smooth to touch	85
Moisturizes my skin	84
Relieves dry, itchy skin	80
Is mild enough for my skin	68
Deep cleans	68
Makes my skin radiant	54
Is customized for my specific skin, lather and scent needs	53
Gives a smoother shave	49

P&G Beauty worldwide survey results, 2002-2004



Women’s Skin Attitudes and Behaviors¹⁹

- 96 percent of U.S. women have experienced dry skin, and 89 percent are bothered by this condition (compared to 73 percent who are bothered by signs of aging)
- 96 percent say it is important for their body wash to moisturize skin
- One-half to almost three-quarters of women with dry skin say they want to fix the problem. To do this, 96 percent use moisturizing lotion, and 48 percent use a moisturizing cleansing product (many women use both)
- 45 percent of the U.S. shower once a day; 37 percent shower more than once a day

...and Men’s²⁰

- 38 percent of U.S. men usually use a cleansing bar in the shower
- 40 percent use a washcloth
- 69 percent of men use the same product to cleanse their face and body
- Men are less bothered by the visible signs of dry skin than women
- More men are interested in a cleanser’s antibacterial effect than women

New Beauty Intelligence

While cleansing in the morning is certainly refreshing, the most important time of day to cleanse is in the evening — after work, after dinner, or before bedtime.



Sleeping with makeup, dirt, and oils on the face can exacerbate acne and other skin problems and diminish skin health. One study found that good hygiene habits utilizing a high-quality cleanser can help to reduce acne in 9- to 18-year-olds with slight to moderate acne.²¹

DID YOU KNOW?

Fascinating Facts about Skin

- The average adult has enough skin surface area to cover a queen-size bed (25 square feet)
- Skin accounts for 12-15 percent of total body weight
- Washing with water alone can compromise the protective barrier properties of the epidermis
- On average, each square half-inch of skin contains 10 hairs, 15 sebaceous glands, 100 sweat glands, and 3.2 feet of tiny blood vessels
- Humans shed about 600,000 particles of epidermis every hour, or about 1.5 pounds a year. By age 70, the average person will have lost about 105 pounds of skin

PROMISING NEW AREAS

Facing the Future: Personal Cleansing Research on the Horizon

Consumer demand coupled with the formulation flexibility provided by new product delivery systems, technologies and ingredients will undoubtedly lead to cleansers that deliver even greater skin benefits in the future.

One priority for P&G Beauty research labs is to further enhance the benefits of its facial and body cleansing products to improve the overall health of the skin.

Other research goals include:

- Improving the skin’s ability to retain moisture
- Reducing signs of aging
- Enhancing the skin’s tactile acuity
- Improving stratum corneum renewal
- Reducing itchiness related to dry skin

Future cleansers will continue to build on a heritage of improving skin health with technologies that will allow for better application of key ingredients as well as an improved overall cleansing experience.

Future body wash innovation is emerging that delivers a discontinuity in lipid deposition that enables up to twice the efficacy of current moisturizing body washes. This innovation also comes with the added bonus of a lather boost, as the unique surfactant system lathers very quickly and efficiently with minimal lipid interaction. This technology breakthrough yields a product with enhanced moisture and twice the lather vs. today’s moisturizing body washes.

SUMMARY

Improper cleansing can harm skin, proper cleansing can improve skin’s health.

Cleansing is a critical part of an overall skincare regimen and should go beyond simply “washing off the dirt.” In addition to providing highly effective cleansing and conditioning benefits, today’s facial and body cleansers improve the health of the skin to make it more resistant to environmental insults.

Traditionally, there have been tradeoffs with cleansers: ones that clean well often irritate the skin, and ones formulated to be mild don’t cleanse completely. New delivery systems combined with milder ingredients carry no such tradeoffs. Cleansing has been elevated to a higher level, offering therapeutic advantages and convenience, enhancing consumer compliance and satisfaction. Proper cleansing with products that deliver moisturizing benefits can help reduce the appearance of aging and help mitigate skin conditions that traditionally have not responded well to cleansing.



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AN ADDITIONAL TOOL

The Personal Cleansing Research Update CD holds a PowerPoint presentation of the charts and illustrations in this toolkit. Feel free to use these images. Please credit P&G Beauty.