Formulator Report: Shaving with Floraesters® 30 and K-100®

Floraesters enhance skin hydration and barrier function:

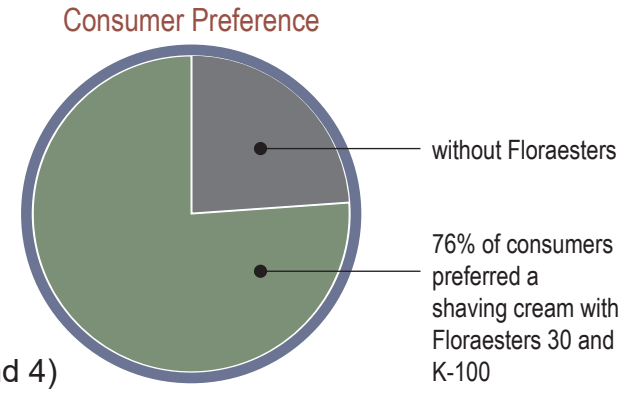
Floraesters 30 provides multiple benefits to personal care formulations, including the ability to boost skin hydration and enhance barrier function, due to its emolliency and occlusivity. Floraesters 30 also has the ability to improve product shelf life due to its superior oxidative stability. Unlike some "jojoba butter" ingredients, Floraesters 30 [INCI Jojoba Esters] is interesterified, not partially-hydrogenated. This produces esters with only cis-unsaturates and no trans-fats. Jojoba is a wax ester and not a triglyceride oil.

Floraesters K-100 Jojoba provides a multitude of formulation benefits. Its substantivity makes it suited to entrap molecules at the skin surface such as water, glycerin, fragrance, sunscreens[1], etc. Floraesters K-100 Jojoba [INCI Hydrolyzed Jojoba Esters (and) Jojoba Esters (and) Water] also plays a role in skin hydration and barrier function restoration.

Clinical studies have shown that Floraesters 30 and K-100 are both effective at reducing the appearance of irritation-associated erythema.[2] Both botanically-derived products are Ecocert certified, and EU and China REACh compliant.

Clinical Study Facts[3]:
In double-blind, vehicle-controlled clinical studies, a formula which contained Floraesters 30 and Floraesters K-100 Jojoba (versus the same formula with aloe alone) resulted in:

- increased skin hydration by +50% (Figure 1)
- decreased skin roughness by +13% (Figure 2)
- increased skin smoothness by +12% (Figure 2)
- increased skin barrier recovery by +30% (Figures 3 and 4)
- was preferred overall by 81% female consumers (Figures 5 and 6)
- was preferred overall by 70% male consumers (Figures 7 and 8)



Formulation Benefits	Floraesters 30	Floraesters K-100 Jojoba
Occlusivity comparable to petrolatum (without stickiness)	X	
Provides "slip" to finished products	X	
Soluble in most oils and some silicones	X	
Emolliency remains after rinse-off		X
Substantivity		X
Water resistant		X
Fragrance fixative		X
Soluble in most alcohols and glycols		X
Results in rich emolliency on skin	X	X
Botanically derived	X	X
Provides extended shelf life due to its oxidative stability	X	X

1. Cargill has not tested Floraesters K-100 Jojoba in final OTC drug formulations. Compliance with FDA regulations is the responsibility of the customer.
2. See Claim Sheets 11-035, 11-036, 11-037, and 11-038 for more information.
3. Final Reports available upon request. Figures can be found on the next two pages of this document.

Figures[4]:

Increased Skin Hydration and Increased Skin Smoothness with Floraesters 30 and Floraesters K-100 Jojoba

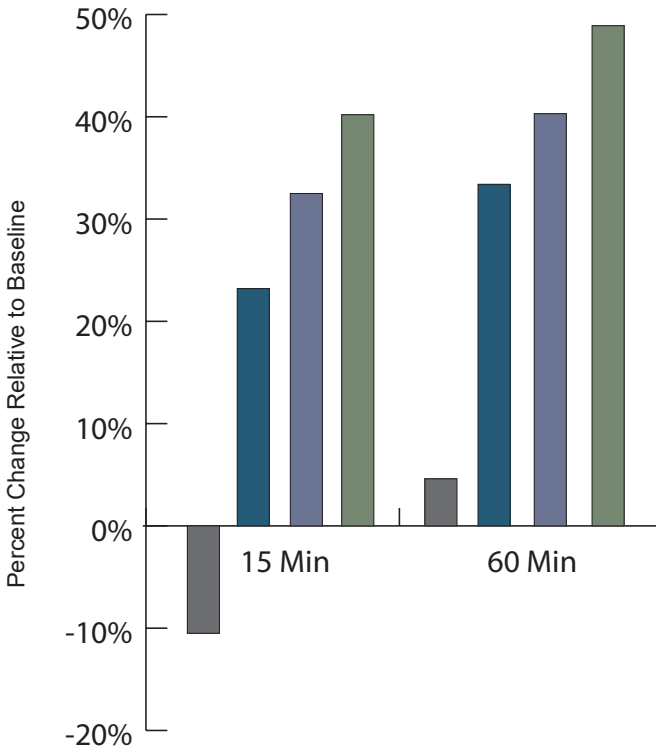


Figure 1: Both shaving creams, which contained 1.5% Floraesters K-100 Jojoba, increased skin hydration statistically significantly ($p<0.001$) better than the vehicle post shave. (See CS 12-042 for study details.)

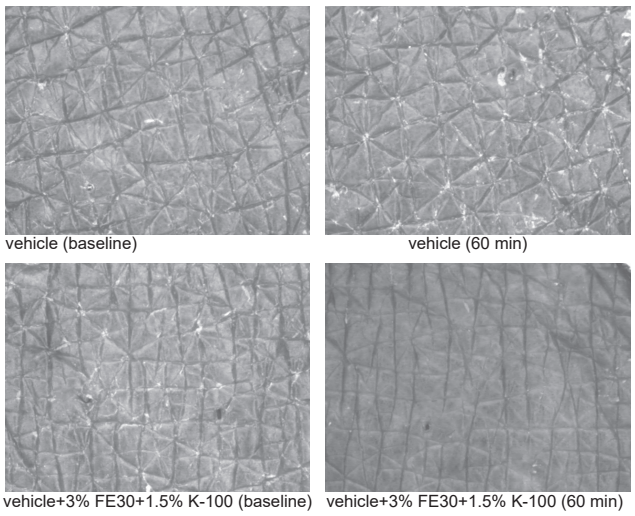
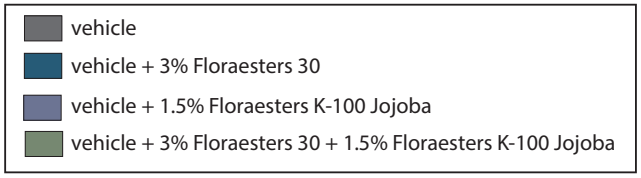


Figure 2: When Floraesters 30 and Floraesters K-100 Jojoba were combined, the averaged score for skin scaliness decreased by 37% ($p<0.001$) and skin smoothness increased by 22% ($p<0.05$). (See CS 12-042 for study details.)



Reduced Barrier Disruption with Floraesters 30 and Floraesters K-100 Jojoba

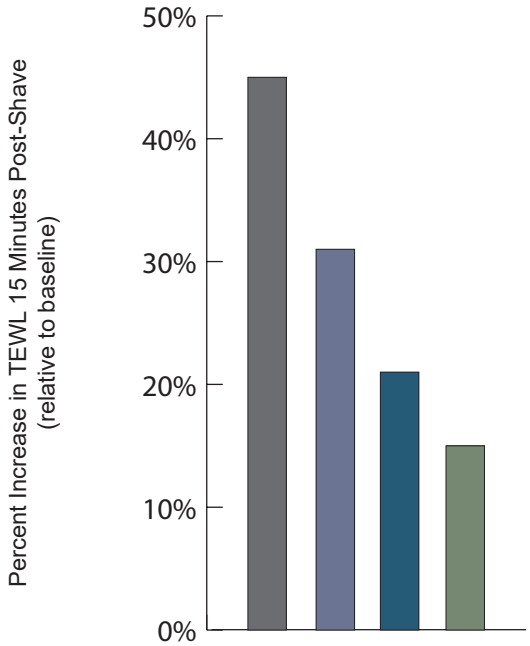


Figure 3: The shaving cream, which contained 3% Floraesters 30 and 1.5% Floraesters K-100 Jojoba, produced the smallest increase (insignificant) in TEWL at 15 minutes. Both shaving creams containing 3% Floraesters 30 increased TEWL less (statistically significantly, $p<0.001$) than the vehicle. (See CS 12-043 for study details.)

Enhanced Barrier Function with Floraesters 30 and Floraesters K-100 Jojoba

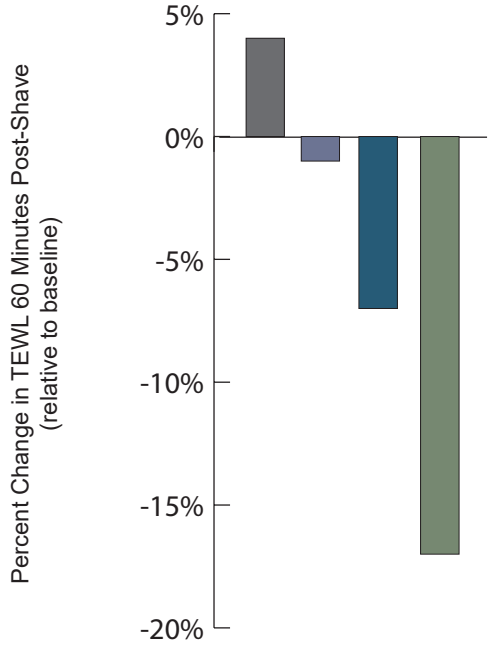
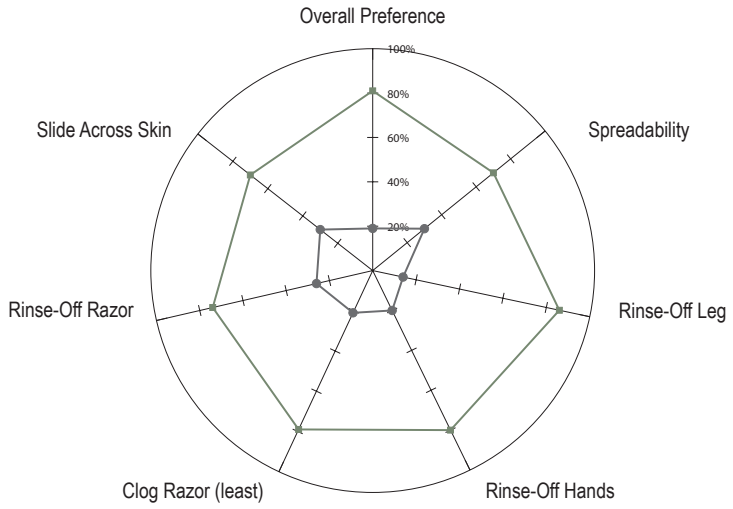
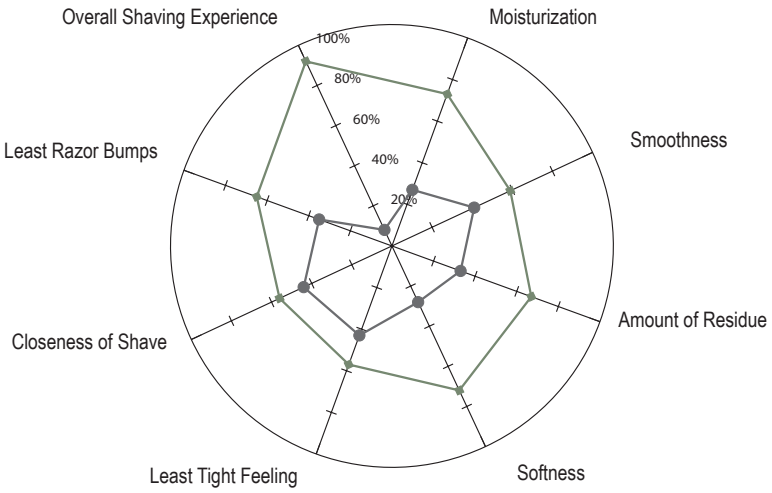


Figure 4: The shaving cream, which contained 3% Floraesters 30 and 1.5% Floraesters K-100 Jojoba, produced the largest decrease ($p<0.05$) in TEWL at 60 minutes. Both test articles containing 3% Floraesters 30 decreased TEWL statistically significantly ($p<0.001$) better than the vehicle. (See CS 12-043 for study details.)

4. All studies were run double-blind and randomized. 3% Floraesters 30 and/or 1.5% Floraesters K-100 Jojoba was incorporated into a shaving cream vehicle (which also contained 1% aloe vera).

81% of Female Consumers Preferred Floraesters 30 and Floraesters K-100 Jojoba within a Shaving Cream



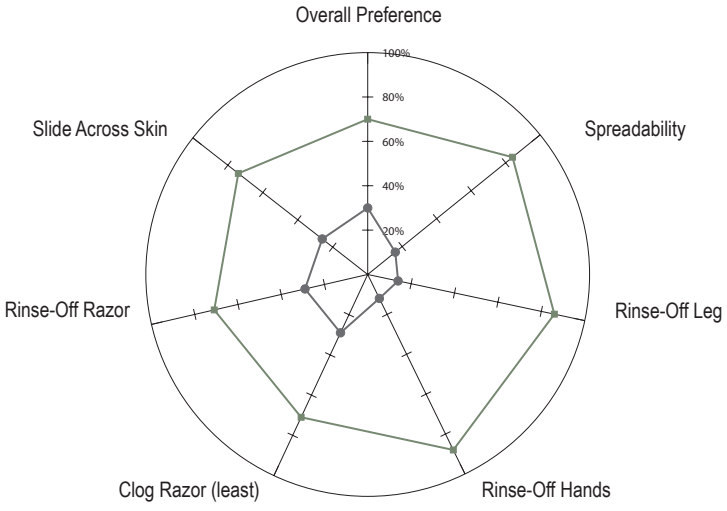


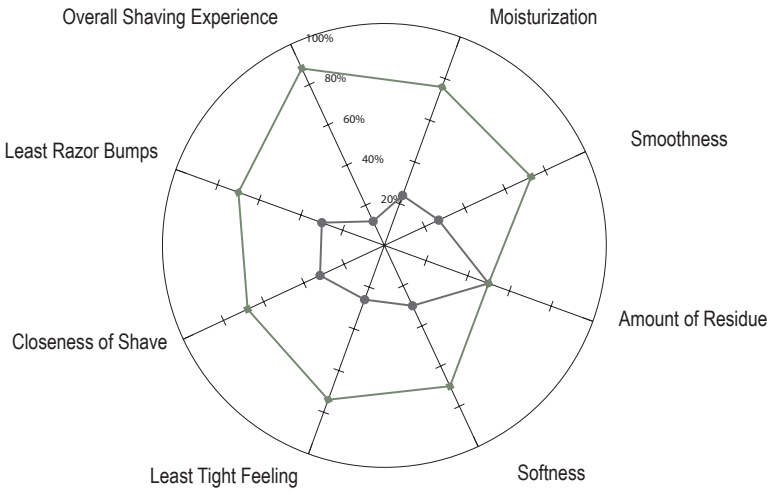
vehicle
vehicle + 3% Floraesters 30 + 1.5% Floraesters K-100 Jojoba

Figure 5: Female consumers stated an overall preference for the shaving cream with 3% Floraesters 30 and 1.5% Floraesters K-100 Jojoba over the vehicle 81% of the time. (See CS 12-044 for study details.)

Figure 6: Female consumers stated an overall shaving experience preference for the shaving cream with 3% Floraesters 30 and 1.5% Floraesters K-100 Jojoba over the vehicle 92% of the time. (See CS 12-044 for study details.)

70% of Male Consumers Preferred Floraesters 30 and Floraesters K-100 Jojoba within a Shaving Cream





vehicle
vehicle + 3% Floraesters 30 + 1.5% Floraesters K-100 Jojoba

Figure 7: Male consumers stated an overall preference for the shaving cream with 3% Floraesters 30 and 1.5% Floraesters K-100 Jojoba over the vehicle 70% of the time. (See CS 12-045 for study details.)

Figure 8: Male consumers stated an overall shaving experience preference for the shaving cream with 3% Floraesters 30 and 1.5% Floraesters K-100 Jojoba over the vehicle 88% of the time. (See CS 12-045 for study details.)

Formula: Premium Shave Cream[5]

This premium shave cream is a chassis for many possible shaving and grooming formulations. It works for shaving leg, face, and intimate areas. It can be used in aerosol foam, cream, or gel format. It resembles popular shaving products in the EU and other countries with high environmental concerns, therefore allowing formulators to avoid the use of volatile organic compounds such as those produced by aerosols.

The emollient phase, featuring Floraesters 30, provides slip and re-fatting of the skin during and after the de-lipidization that commonly occurs when dragging a blade across the skin surface; so much so in fact that those usually requiring an after-shave moisturizer may not need to take that additional step after shaving with this product. The weight of the residual after-feel can be modified by adjusting the amount of the Floraesters 30 or character of whichever butter you choose to use. For example, swapping out 1% of Floraesters 30 for 1% Moringa Butter provides a much richer after-feel if desired.

The product also includes a unique moisturizing system combining Floraesters K-100 with glycerin for fast and persistent moisture, while soothing any possible redness from shave irritation.

Slip, conditioning, and final viscosity can be modified by changing the amount of Celquat SC-230M. The product, as rich as it is, rinses off the blades quickly with a small amount of warm water. Lastly, a thixotropic viscosity profile allows easier mechanical filling and a more stable cream in the finished package.

Phase	Trade/Common Name	INCI Name	Manufacturer	%wt./wt.
A	Deionized Water	Water	- - - - -	q.s.
	Celquat® SC-230M	Polyquaternium-10	AkzoNobel Chemicals	0.30
	Veegum® HV	Magnesium Aluminum Silicate	Vanderbilt Minerals, LLC	0.40
	Versene® 220 Crystals	Tetrasodium EDTA	The Dow Chemical Co.	0.20
	1,3-Butylene Glycol	Butylene Glycol	OXEA Corporation	2.00
	Glycerin, USP	Glycerin	The Dow Chemical Co.	2.00
	Floraesters K-100® Jojoba	**Hydrolyzed Jojoba Esters (and) Jojoba Esters (and) Water (Aqua)**	**Floratech**	**1.50**
B	Triple Pressed Stearic Acid	Stearic Acid	Essential Ingredients	12.50
	Floraesters® 30	**Jojoba Esters (and) Tocopherol**	**Floratech**	**3.00**
	Jeechem® PGMS	Propylene Glycol Monostearate	Jeen International Corp.	3.50
	Polytex® 10M	Glycol Stearate (and) Stearamide AMP	Lipo Chemicals, Inc.	1.00
C	Triethanolamine	Triethanolamine	Rita Corporation	0.50
	Activaloe® Aloe Vera Gel QM 200X Flakes (0.5% solution in water)	Aloe Barbadensis Leaf Juice (and) Water	Aloecorp	0.50
	Preservative[6]	Preservative	- - - - -	q.s.
	Fragrance[7]	Fragrance	- - - - -	q.s.
			TOTAL	**100.00**

Procedure:

1. Combine water and Celquat SC-230M of Phase A at room temperature under propeller mixing in a suitable vessel. Heat mixture to 50°C and add Veegum HV with propeller agitation until fully hydrated.
2. Shift to homomixing, add Versene 220 Crystals, and heat to 80°C. Add the remaining ingredients of Phase A with homomixer agitation.
3. Combine all ingredients of Phase B in a separate vessel. Melt and mix at 80°C.
4. Add Phase B to Phase A with homomixer agitation at 80°C until smooth.
5. Shift the mixture to propeller agitation and begin cooling. Add Triethanolamine of Phase C with propeller agitation at 55-60°C.
6. Cool to 40-45°C and add remaining ingredients of Phase C.
7. Cool to 30°C before filling containers.

Formula Properties:

Property	Result
pH	7.0-7.5
Viscosity	>160 kcP
Appearance	heavy cream
Texture	smooth

5. Exact INCI/trade names must be verified with each manufacturer's product specifications.
6. Preservative: Kathon® CG [INCI: Methylchloroisothiazolinone (and) Methylisothiazolinone] supplied by Rohm & Haas Co.
7. Fragrance: Zen 6110612 supplied by Bell.