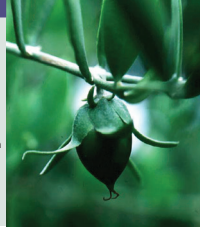


Benefits of hydrolysed jojoba esters in face masks

Hydrolysed jojoba esters are derived from *Simmondsia chinensis* (jojoba) seed oil, and impart many of the benefits of jojoba oil, while also providing a unique array of additional benefits. Jojoba oil has been used in folk remedy for sunburn treatment, chafed skin, dry scalp, and wounds,² and has been further explored more recently for its anti-inflammatory nature.³ Hydrolysed jojoba esters have been used in various cosmetic and personal care products from lotions and creams, to non-woven wipes and face masks. These multifunctional hydrolysed jojoba esters have been shown to hydrate the skin when used in combination with glycerin, improve barrier function in damaged skin, and provide product aesthetics that are pleasing to many consumers.⁴

ABSTRACT

In a series of double-blind, vehicle-controlled, randomised clinical studies, Floraesters K-20W Jojoba (INCI: Hydrolyzed Jojoba Esters (and) Water (aqua)) was shown to increase skin elasticity, firmness, and hydration; decrease the number of enlarged pores and fine lines; and increase consumer preference when incorporated into a nonwoven facemask solution. These data support previous findings, demonstrating the effectiveness of Floraesters K-20W Jojoba in non-woven wipe applications for skin hydration, redness reduction, and enhanced consumer preference.¹



Key Points for Customers:
Global face mask market statistics.

Face mask market

The face mask market is a constantly growing market. In 2013, in China alone, the face mask market totalled \$1.8 billion (US dollars), up 13% from 2012.¹ Similar trends are starting to be seen in the US and European markets, with 2013 markets totalling \$65 million and \$442 million (US dollars), respectively.¹ The non-woven wipe industry has numerous players like Unilever, Procter & Gamble, and Johnson & Johnson; however, now major players are also entering the face mask market, such as L'Oréal purchasing Magic Holdings International of Guangzhou, China for almost \$900 million (US dollars).²

Floraesters K-20W Jojoba can provide additional functionality to products in this emerging market.

Study design

One per cent (1%) Floraesters K-20W Jojoba (now referred to as hydrolysed jojoba esters) was incorporated into a standard non-woven face mask solution and compared to the vehicle solution without hydrolysed jojoba esters (see Table 1). The study involved sixteen female subjects using the face mask once a day for two weeks. The following measurements were taken before and after two weeks of face mask use: skin hydration using the Corneometer CM 825

(Courage+Khazaka, Köln, Germany), skin elasticity and firmness were taken with the MPA Cutometer (Courage+Khazaka, Köln, Germany), and enlarged pores (defined as an enlarged pore that meets the detectable size threshold of >0.5 mm) and fine line counts (defined as thin lines produced by skin creases/thinning) using the BTBP Clarity Pro Advanced and Facial Stage DM-3 (Brightline Bio-Photonics, LLC, San Jose, CA, USA). A consumer perception survey was also completed after three days of once-daily face mask use on non-face mask users in Arizona, US (n=26 females) and current face mask users in Taiwan (n=26 females). All studies were double-blind, randomised, and vehicle controlled.

Table 1: Vehicle Face Mask.

Ingredient	%w/w
Water	94.320
Butylene Glycol	4.000
Glycerin	1.500
Xanthan Gum	0.120
Hydroxyethylcellulose	0.060
Chlorphenesin	0.050
PEG-4 Laurate (and) Iodopropynyl Butylcarbamate	0.037
Sodium Hyaluronate	0.016
Methylisothiazolinone	0.005

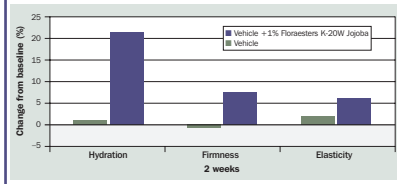


Figure 1: Increased skin hydration, firmness, and elasticity.

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Key Points for Customers:
The face mask containing Floraesters K-20W Jojoba increased hydration, firmness, and elasticity.

Key Points for Customers:
Further detail regarding the increase of hydration, firmness, and elasticity shown in Figure 1.

Key Points for Customers:
Further detail regarding the decrease in enlarged pores and fine lines shown in Table 2.

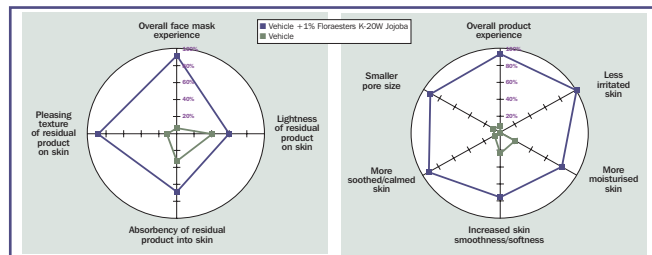


Figure 2: Overall face mask experience (non-face mask users).

Figure 3: Overall product performance (non-face mask users).

conducted under controlled environmental conditions (20°C-22°C and <50% relative humidity).

Increased skin hydration, firmness, and elasticity

After two weeks of once-daily face mask use, the face mask containing 1% hydrolysed jojoba esters increased skin hydration by greater than 20% ($p < 0.0001$), skin firmness by just over 8% ($p < 0.05$), and skin elasticity just over 5% ($p < 0.01$) versus the vehicle face mask (Fig. 1).

Reduced enlarged pores and fine lines

Hydrolysed jojoba esters produced dramatic benefits on reductions in pore size (as measured by decreased enlarged pore counts) and reductions in the number of fine lines after two weeks of once-daily face mask use (Table 2). The face mask which contained 1% hydrolysed jojoba esters performed statistically significantly better ($p < 0.05$) than the vehicle (67% of consumers versus 40%, respectively) in reducing the number of fine lines. Furthermore, 80% of the consumers demonstrated a decrease in pore size when using the face mask with 1% hydrolysed jojoba esters compared to only 56% of the consumers for the face mask without hydrolysed jojoba esters ($p < 0.05$).

Consumer preference

Although bio-instrumental data provide information on the functional benefits of a product, consumer perception data show whether or not consumers can realise the effects. The ability of 1% hydrolysed jojoba esters to enhance consumer preference was evaluated on both non-face mask users and face mask users. Both groups are equally important; face mask users

demonstrate the expected standard in established markets, while non-face mask users show the growth potential in some of the less established markets, like the US.

For the face mask users, the addition of 1% hydrolysed jojoba esters produced a 93% preference for overall face mask experience (Fig. 2). This group of consumers also indicated a statistically significant preference ($p < 0.05$) for the face mask with hydrolysed jojoba esters over the vehicle face mask for the following categories: overall product experience, absorbency of residual product into skin, pleasing texture of residual product on skin, overall product performance, less irritated skin, more

moisturised skin, smaller pore size, increased skin smoothness/softness, and more soothed/calmed skin (Figs. 2&3).

For the non-face mask users, the addition of 1% hydrolysed jojoba esters resulted in 88% preference for overall face mask experience (Fig. 3). This group of consumers also indicated a statistically significant preference ($p < 0.05$) for the face mask with hydrolysed jojoba esters compared to the vehicle for the following categories: overall product experience, lightness of residual product on skin, pleasing texture of residual product on skin, overall product performance, less irritated skin, decreased redness, increased skin smoothness/softness, and more soothed/



Table 2: Enlarged pores and fine lines.

Skin health parameter	Test article	Mean difference (count)	Subjects that showed a decrease (%)
Enlarged pores	Vehicle + 1% K-20W	-115	80%
	Vehicle	-21	56%
Fine lines	Vehicle + 1% K-20W	-5	67%
	Vehicle	2	40%

Key Points for Customers:
The face mask containing Floraesters K-20W Jojoba resulted in a greater preference for overall face mask experience and overall product performance for non-face mask users.

Key Points for Customers:
The face mask containing Floraesters K-20W Jojoba resulted in decreases in enlarged pores and fine lines.

Key Points for Customers:

The face mask containing Floraesters K-20W Jojoba resulted in a greater preference for overall face mask experience and overall product performance for face mask users.

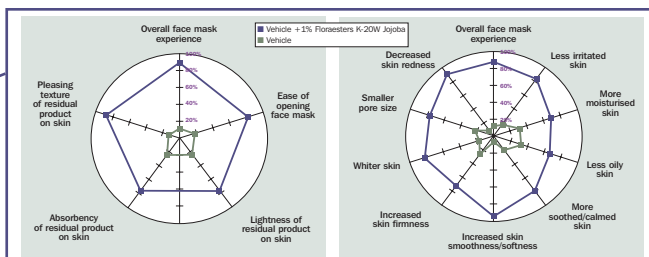


Figure 4: Overall face mask experience (face mask users).

Figure 5: Overall product performance (face mask users).

calmed skin. Additionally, these consumers indicated a directionally significant preference ($p < 0.1$) for the face mask with hydrolyzed jojoba esters for the following categories: ease of opening the face mask, absorbency of residual product into skin, increased skin firmness, and smaller pore size (Figs. 4 & 5).

Conclusion

The non-woven industry, and more specifically face masks, is an industry that has only started to take off. Creating innovative, functional face masks is a must to continue to gain consumer acceptance. Floraesters K-20W Jojoba can readily be incorporated into these systems to provide

synergistic skin hydration when used with glycerin.⁶ It is able to be dispersed in glycols, and has already begun to see use in various face masks currently being marketed in Asia. Floraesters K-20W Jojoba offers a botanically-derived, functional platform to non-woven face masks which can provide a number of beneficial attributes including skin hydration, skin elasticity and firmness, reduction of pore size and fine lines, as well as enhanced consumer preference.

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