

# facts



Naturally soothing  
aftershave balsam

**Jungbunzlauer**

*From nature  
to ingredients®*

## Introduction

When we shave we not only cut and remove unwanted hair: the razor also scrapes the surface of the skin, removing skin cells. This may lead to irritation which manifests as redness, itching and a sensation of tension. The outermost skin layer acts as a natural barrier, and losing it leaves the skin more prone to dryness and more susceptible to external impacts. A suitable aftershave soothes and nourishes stressed skin and crucially counteracts symptoms of irritation, restoring moisture and protecting the skin. <sup>[1,2]</sup>

While early aftershaves relied mainly on the antibacterial and astringent effects of alcohol, today's product landscape is much more diversified, ranging from the classic eau de cologne-type aftershaves to lotions, gels and balms. Product databases such as Innova Market Insights reveal several trends in which moisturising and hydrating properties play a major role. This is indeed a very important aspect of dry skin prevention. Typical moisturisers include glycerine, glycol or propylene glycol. Another major claim relates to suitability of the product for sensitive skin. In this case the choice of ingredients needs particular attention to avoid allergic reactions and maximise soothing and nourishing effects. While moisturisers are important here, too, other classes of substances, such as vitamins, certain plant extracts and antiseptic compounds, also have a role to play. In line with the demand for products for sensitive skin are trends towards alcohol-free formulations (alcohol is harsh on skin and contributes to drying out as it evaporates), dermatologically tested products and formulations reducing redness. <sup>[3]</sup>

Overall, consumers have high expectations regarding the functionality and effectiveness of aftershaves, but one important trend seen in other segments of the personal care market is still underdeveloped. This is the demand for natural, plant-based formulations. The market for male skin care is still dominated by traditional, often synthetic ingredients. This can be observed in the field of moisturisers with their petrol-based glycols, and also with viscosity control agents, where we find the synthetic polymer carbomer and again some glycols topping the lists of ingredients in this category. However, it is to be expected that the general trend towards natural ingredients will also affect the aftershave market, and indeed the first signs of this can already be seen. There is no real technical barrier to creating an aftershave formulation based on ingredients from natural origin. Fermentation-derived ingredients such as lactates or erythritol have been shown to provide excellent moisturising activity in both leave-on and rinse-off formulations. The natural thickener xanthan gum is already used to stabilise suspensions, emulsions and foams. So why not use them in an aftershave?

In this paper we explore the feasibility of creating an aftershave based on natural ingredients. In particular, we will show that potassium lactate helps reduce skin irritation and restore moisture to the skin.



## Methods

Two types of tests are widely used in the cosmetic industry to evaluate and prove the soothing and anti-irritant properties of an aftershave product as well as its moisturising performance. One is a shaving irritation study to assess the anti-irritant potential of leave-on cosmetics, in which the product is compared with an untreated control in a forearm shaving model. The other measures the level of skin hydration to assess the moisturising potential of cosmetic ingredients used in leave-on formulations.

The shaving irritation study is based on controlled post-shave irritation in defined test areas on the volar forearms caused by shaving without a lubricant. Erythema is induced using a disposable razor and a defined number of strokes for three consecutive days. A special test setup was developed to evaluate soothing and anti-irritation performance. The tested products were applied twice daily for three days, once directly after shaving and once in the evening. One test site was left untreated and functioned as control. On days 1 to 3 a subjective assessment of skin feeling was performed directly after the first product application of the day. On day 4, skin redness was also measured using a chromameter (Chroma Meter CR400, Minolta, Germany). A pea-sized amount of each product was applied to a 4 cm x 4 cm test area and distributed evenly with a cotton swab. The panel consisted of 28 subjects, 39% male and 61% female, aged between 41 and 65 years. These panellists evaluated the subjective skin status (itching, burning, tension) according to the following scale: 0 = none, 0.5 = very slight, 1 = slight, 2 = moderate and 3 = strong. Skin colour was quantified by reflectance measurements using a tri-stimulus chromameter.

The measuring principle is based on the reflection of a Xenon flash that diffusely illuminates the skin. The reflected light is detected by silica photodiodes, providing a colour analysis of the detected light. The chromameter defines the measured colour according to the L\*a\*b\* colour coordinate system, where the a\* value defines the red-green axis and correlates with the visual assessment of skin redness (erythema).<sup>[4]</sup>

The study of moisturising potential is based on skin hydration level measurements using a Corneometer® in defined test areas on the volar forearms compared to an untreated control area. Skin moisture content measurement with the Corneometer® is a common, non-invasive technique for evaluating the moisturising potential of cosmetic products. The tested products were applied for 14 days and skin moisture content was measured using the Corneometer® on day 0, day 7 and day 14. A pea-sized droplet of each product was applied to the upper or lower part of the volar forearm and distributed with circular movements of the finger.

The different products were applied daily by a panel of 20 subjects, 35% male and 65% female, aged between 23 and 55 years. The Corneometer® measures the hydration of the outer layer of the epidermis (stratum corneum) and detects the smallest changes in skin surface hydration. The measuring principle is based on changes of the dielectric constant of a precision capacitor.<sup>[5]</sup>



## Aftershave Balsam for men

We have developed an alcohol-free aftershave balsam formulation containing only naturally derived ingredients. It proved possible to create a smooth, white and creamy emulsion using potassium lactate as soothing and moisturising agent; sodium gluconate as chelating agent; xanthan gum as stabiliser and thickening agent; and lactic acid to adjust the pH value. All these products are available from Jungbunzlauer in a special personal care grade and are approved by ECOCERT/COSMOS as raw materials for use in cosmetics. They are produced by fermentation of renewable, GMO-free raw materials, are readily biodegradable and safe to use.

### After shave balsam MEN

with Potassium Lactate and Xanthan Gum



Phase	Ingredients	INCI	Supplier	Quantity
A	Deionised Water	Aqua	Jungbunzlauer	Qs to 100%
	Potassium Lactate 60 % Personal Care Grade	Potassium Lactate	Jungbunzlauer	2.50 %
	Sodium Gluconate	Sodium Gluconate	Jungbunzlauer	0.50 %
	Xanthan Gum FNCSP Personal Care Grade	Xanthan Gum	Jungbunzlauer	0.50 %
		Glyceryl Stearate Citrate	Evonik	1.00 %
B	Axol C62 dermolact® sensolv	Isomyl Laurate	Dr. Straetmans	5.00 %
	Tocopherol	Tocopherol	Naturschönheit	1.50 %
	Joboba Oil	Simmondsia Chinensis Seed Oil	Diverse	1.50 %
C	Preservative	Parfum	Diverse	Qs
	Perfume L(+)-Lactic Acid 90 % Heat Stable Personal Care Grade	Lactic Acid	Jungbunzlauer	Qs



### Directions

- Heat phase A up to 75 °C (167 °F)
- Heat phase B up to 75 °C (167 °F)
- Add phase B under stirring slowly to phase A
- Homogenise with an Ultra Turax
- Cool down to 35 °C (95 °F) and add phase C under stirring
- Adjust pH value

### Technical Data

Appearance: white creamy emulsion  
pH Value: 5.1 – 5.5  
Viscosity: 6000 mPa·s at 0.01 s<sup>-1</sup>

### Stability

Stable for more than 3 months stable at 4 °C (39.2 °F), 20 °C (68 °F),  
30 °C (86 °F)



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In the following section we show that this formulation provides the attributes expected of an anti-irritant and moisturising product.

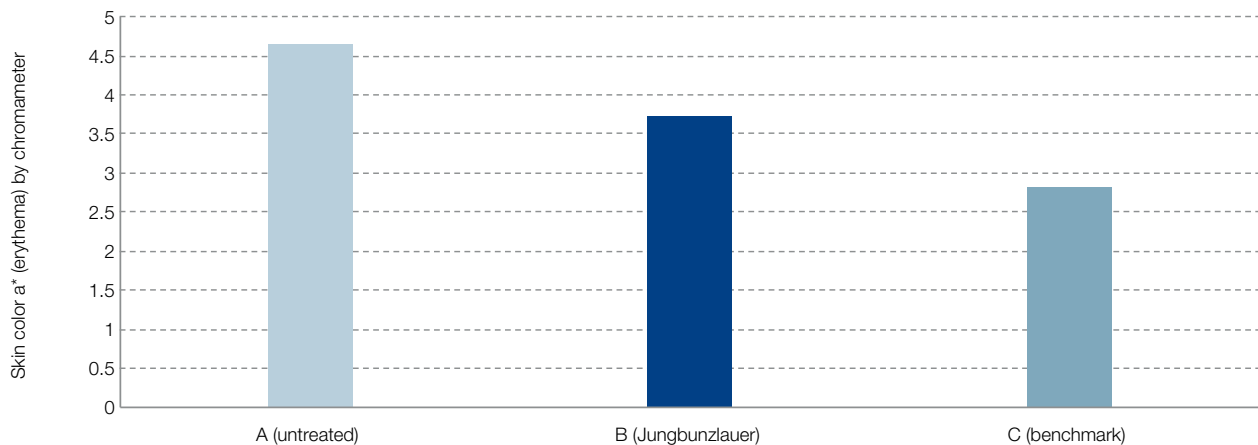
## Results

### Shaving irritation study

In a first step we tested the anti-irritant and soothing potential of our formulation. As described in the methods section, controlled post-shave irritation was induced by shaving a test area on the forearm of volunteers without a lubricant. The test products were applied twice a day. After 3 days the skin colour of control and treated areas was assessed using the chromameter. Figure 1 shows the results of this analysis.

The shaved but untreated control area (A) clearly shows the highest skin redness values, indicating moderate skin irritation. In contrast, areas treated with our formulation (B) or with the market benchmark (C), a renowned brand, are characterised by a significantly lower value, i.e. the treatment effectively reduced skin irritation. While our formulation with potassium lactate did not achieve the same low redness value as the benchmark, it has the advantage of being an ECOCERT/COSMOS-compliant product based on ingredients of natural origin and its ingredients list is less than half as long as that of the benchmark. In view of the fact that this natural formulation is free from alcohol, glycols, carbomers and artificial chelators it is a remarkable result.

**Figure 1: Differences in skin redness compared to an untreated control area at day 4 (mean values of 28 panellists); low a\* values correspond to low redness values;  $p \leq 0.05$ .**



This positive result is given even more weight by the outcome of the subjective dermatological evaluation. The study participants were asked to rate sensations of itching, burning and tension sensation for control and products. A detailed overview is provided in figure 2. One can see that itching was virtually not a problem, except for day 1, and after three days there was no difference between treated and untreated areas. The picture changes when perceptions of burning and tension are analysed. Here, we find a clear difference: with our formulation the burning sensation and feeling of skin tension were reduced in comparison with the benchmark. The fact that the untreated area generally shows the lowest values is related to the test setup. The rating was done immediately after application (or not) of the products, when the skin was freshly stressed by shaving. In this situation the skin is very sensitive to any applied product and a slight feeling of burning or tension can seldom be excluded. However, a good formulation will reduce this discomfort to a minimum and deliver the essential anti-irritant and moisturising actives in a pleasant way.



What does this mean? The market benchmark achieves a more pronounced reduction of skin redness at the expense of skin feel. In other words: the natural formulation tested combines anti-irritant properties, measured as skin redness reduction, with a high level of skin soothing and nourishing, as registered by the better subjective evaluation of the skin feel by the panellists. Hence in this case naturalness really does go hand in hand with efficacy.

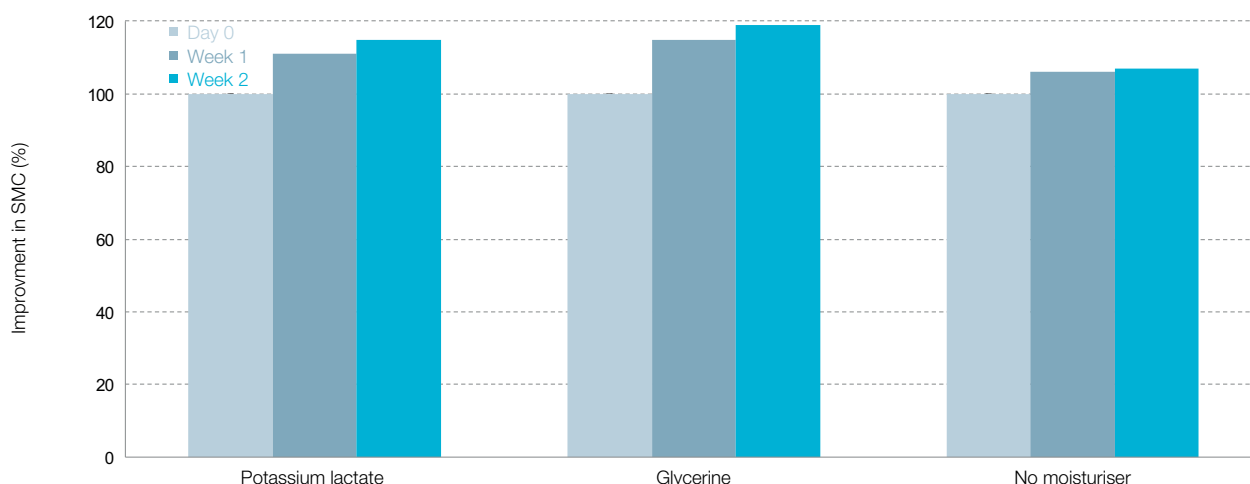
**Figure 2: Subjective dermatological evaluation of the shaving irritation test by the panellists (n = 28); indicated are the mean scores, where 0 = none, 0.5 = very slight, 1 = slight, 2 = moderate, 3 = strong.**

Code	Day 1	Day 2	Day 3
		<b>Itching</b>	
A (untreated)	0.1	0.1	0.1
B (Jungbunzlauer)	0.2	0.2	0.1
C (benchmark)	0.6	0.1	0.1
		<b>Burning</b>	
A (untreated)	0.2	0.3	0.4
B (Jungbunzlauer)	0.7	0.7	0.9
C (benchmark)	0.9	0.9	1.2
		<b>Tension</b>	
A (untreated)	0.1	0.1	0.2
B (Jungbunzlauer)	0.3	0.1	0.3
C (benchmark)	0.4	0.3	0.6

### Moisturising study

In a second study we evaluated the moisturising potential of different leave-on formulations and compared them with an untreated control area. We tested the formulation under review, containing Jungbunzlauer's potassium lactate, against the same formulation with either the commonly used moisturiser glycerine in place of potassium lactate or no added moisturising agent. Figure 3 represents the results of this moisturising study as percentage improvement in skin moisture content (SMC) after application of the test and reference formulations compared to an untreated skin area control. It shows SMC improvement one week (blue) and two weeks (green) after application of the formulations as compared with day 0 (dark blue). The formulations containing potassium lactate or glycerine improve skin moisture content compared to the formulation without any moisturiser. An increase of 15% in the skin hydration level can be observed after 14 days' treatment with the formulation containing potassium lactate. For the formulation with glycerine an increase of 19% was detected. Glycerine therefore shows a slightly better performance in this specific formulation than potassium lactate, but was not as convincing as regards skin feeling and sensory perception. The glycerine-based formulation was described as slightly sticky and was associated with an unpleasant skin feeling, whereas the formulation with potassium lactate provided a smooth, pleasant texture.

**Figure 3: Differences to control area for skin moisture content (SMC) measured by corneometer (mean values of 20 panelists) after application of test and reference formulations. SMC of 100% indicates the starting position.**



## Conclusion

We have demonstrated that it is possible to formulate an aftershave balm based on natural ingredients without compromising on functionality. The formulation has a short ingredients list, conforms to ECOCERT/COSMOS standards and shows good anti-irritant, soothing and moisturising properties. The shaving irritation test evidenced a significant reduction of skin redness after application of the product and the panellists reported a pleasant skin feel with almost no sensations of burning or tension sensation. The natural formulation was also convincing from the perspective of moisturising and texture. The corneometer study demonstrated that its positive effect on skin hydration was almost equivalent to the market benchmark glycerine, and the potassium-lactate-based formulation was perceived as pleasant on the skin, in contrast to the sticky sensation with glycerine. In summary, ingredients of natural origin provide multiple benefits to aftershave and other skin care formulations. Potassium lactate is a powerful moisturiser and helps combat skin irritation, xanthan gum creates a stable texture and sodium gluconate provides chelating effects. Combining naturalness, efficacy and pleasantness is not an impossibility, but proven reality.

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## Picture Credits

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## About Jungbunzlauer

Jungbunzlauer is one of the world's leading producers of biodegradable ingredients of natural origin. We enable our customers to manufacture healthier, safer, tastier and more sustainable products. Due to continuous investments, state-of-the-art manufacturing processes and comprehensive quality management, we are able to assure outstanding product quality. Our mission "From nature to ingredients®" commits us to the protection of people and their environment.

Jungbunzlauer ingredients for soothing, chelating and stabilisation are produced by fermentation of natural, renewable resources and are therefore a good alternative to synthetic chemicals used in personal care applications. They provide efficient functionality, leave a smooth skin feel and are compatible with most other components in common formulations. Jungbunzlauer potassium lactate is available as concentrated aqueous solution. Sodium gluconate and xanthan gum are provided in dry form.

All of these ingredients are approved by ECOCERT/COSMOS as raw materials for use in personal care.

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