



TESCO DreamSkin® Wearer Trial

Results

August 2014

Introduction

TESCO® and DreamSkin Health® have developed a new range of soft cotton clothing incorporating the DreamSkin polymer, as a benefit for skin health and protecting delicate and sensitive skin in infants under one year. The new TESCO DSH garments require a wearer trial to assess skin benefits, durability and garment care. Working with TESCO's fabric technology team, the DSH team devised a wearer trial to answer questions on the therapeutic effects of DSH garments for children and adults with a diagnosed skin condition and those with either dry or normal skin, i.e. no diagnosed skin condition.

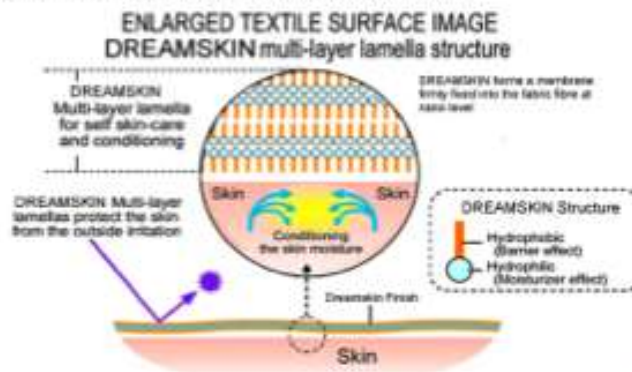
The DreamSkin polymer

The Dreamskin polymer improves moisture levels of both damaged and healthy skin, acts as a barrier to common skin irritants and helps regulate body temperature. When applied, the Dreamskin polymer forms a hydrogel on the surface of fibres. This hydrogel has high moisture retention properties and provides protection against irritants caught in clothing fibres such as SDS, a known irritant commonly found in washing powders. The treated textile supports a self healing ability, assisting the soothing and repair of dry and damaged skin. The Dreamskin polymer is very durable against home laundering.

Dreamskin® Health enhances the natural function of skin

- Dreamskin® Health clothing is treated with a phospholipid-analogue containing phosphorylcholine polymers.
- The multi-layer lamella structure formed when these polymers are applied to fabric is both hydrophobic and hydrophilic.

The hydrophobic element provides an external barrier effect against irritants and the hydrophilic provides a moisture retaining and enhancing property.



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Technological data

The data below shows a relative recovery of the epidermal moisture for DreamSkin polymer as three times that of untreated fabric and 1.6 of squalene treated fabric¹

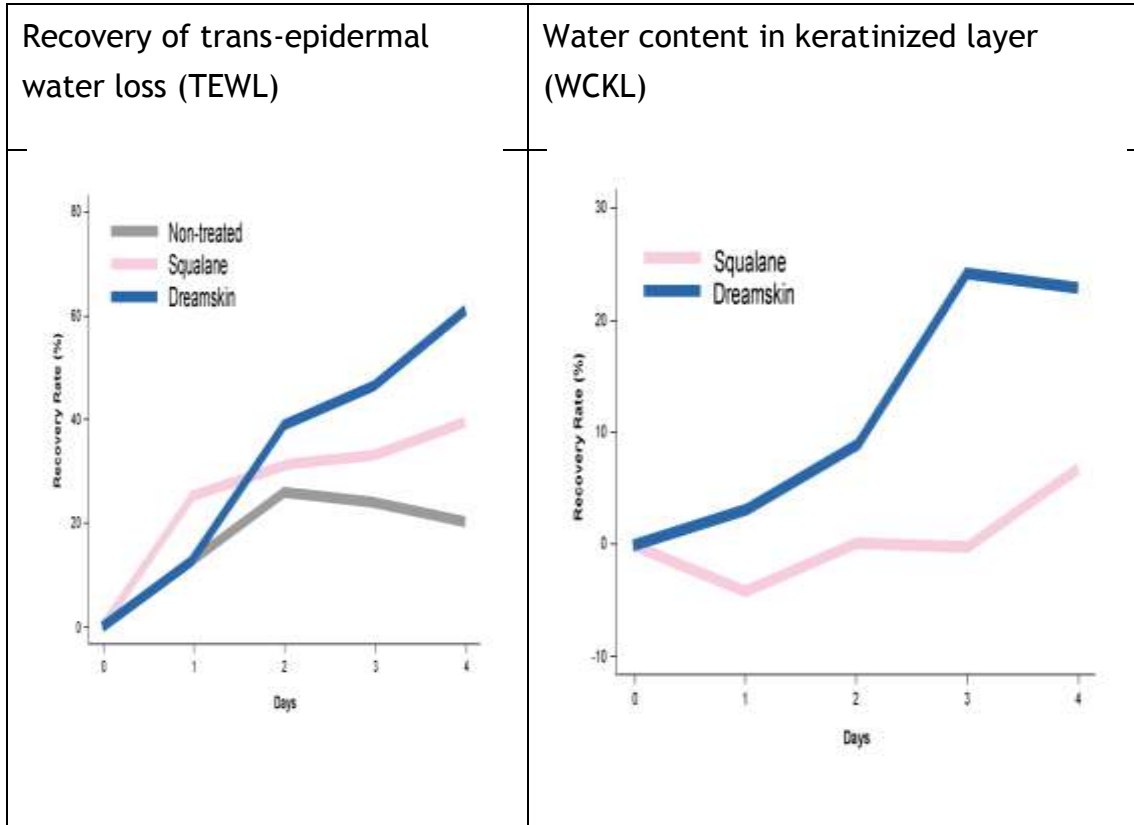


Table 1: Comparison of DreamSkin polymer, non-treated fabric and squalene treated fabric for recovery of TEWL and WCKL¹

The figure below shows how TEWL and WCKL is tested.



Table 2 shows that DreamSkin Health Polymer reduces contact between skin and contact irritants

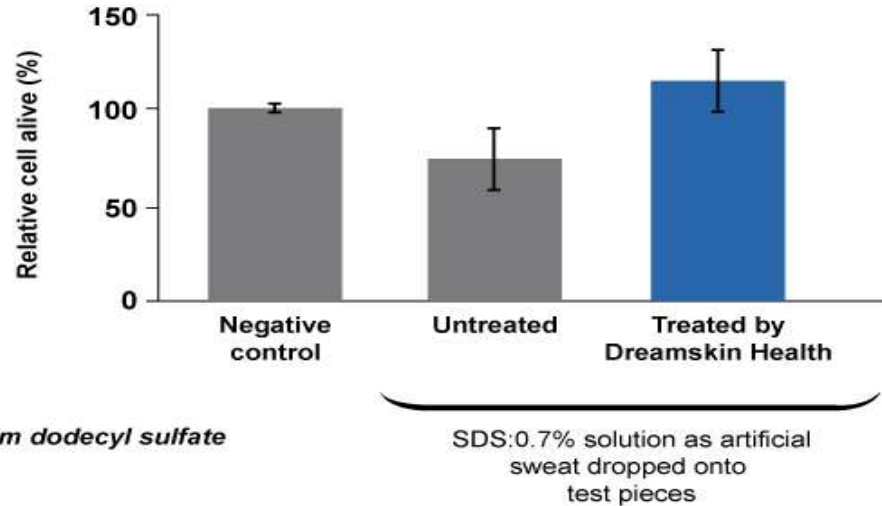
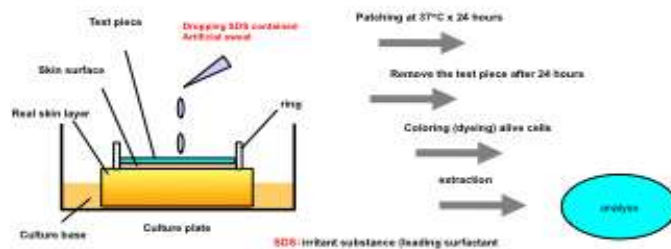


Table 2: Comparison of DreamSkin polymer and untreated fabric to test contact between skin and contact irritants²

Table 2 shows cell alive improvement for DreamSkin polymer compared to an untreated fabric is in the order of 40% (95% CI:31-49) more celled alive after 24 hours.² The figure below shows how the skin protection test was conducted.

The skin protection test of Dreamskin® Health textiles has been carried out utilising JIS L 1918 – Japanese Industrial Standard approved test for primary skin irritation.



V : cell alive %
 $V = (A_1 - b) / (A_0 - b) \times 100$
 A_1 : sample light wave absorbency
 A_0 : control light wave absorbency
 b : extracted solution light wave absorbency

	24 hours patching	48 hours patching
positive	$V < 50$	-
marginally positive	$50 > V < 80$	$V < 50$
negative	$V > 80$	-
	$80 > V < 90$	$V > 50$

This test was repeated on five samples for each treatment. (20 total)
 Cell Alive count is set as 100% for skin pieces which are not treated but follow the dyeing and extraction process. This sets a relative 100% as a baseline comparison.

Wearer Trial Design

The TESCO wearer trial invited participants to wear and wash DSH cotton garments and complete a questionnaire based on their experiences. The questionnaire comprised open and closed questions designed to assess the therapeutic effect on the wearer's skin and the durability of the garments after a period of use. The participants were instructed to wear the garments for 14 days, either day and/or night and wash them as required.

Participants

The number of participants invited to complete the TESCO wearer trial was twelve. The participants were a self-selected group of staff and their relatives from the TESCO fabric technology department, based at head office in Welwyn Garden City, the ages of whom are outlined in table 3.

Age range	Number of participants
0-5 years	4
6-12 years	1
13-19 years	0
20-40 years	5
41-60 years	1
Over 60 years	1
Total number of participants	12

Table 3: TESCO wearer trial participants' age ranges

Eleven participants completed the trial, of which four were male and seven female. Eight of these have a diagnosed skin condition; the remaining three describe their skin as normal or dry. The types of skin conditions for all the participants are outlined in table 4.

Skin condition	Number of participants	No diagnosed skin condition	Number of participants
Eczema	5	Normal skin	1
Psoriasis	2	Dry Skin	2
Eczema and psoriasis	1		
Total number of participants	8		3

Table 4: TESCO wearer trial participant's skin condition

Four of the participants describe their skin condition as lifelong; one person has had a skin condition for 20 years, two people for five to 10 years and two people for two years or less (this included one person with dry skin).

Eight of the participants regularly use emollients to manage their skin condition; six use treatments to manage eczema flares and one uses psoriasis treatments. Some use a combination of emollients, flare and psoriasis treatments.

The participants were all supplied with the following types and numbers of DSH garment/s

	Top (1 garment supplied)	Bottoms (1 garment supplied)	Bodysuit (x 2 garments supplied)
Child (aged 0-5 years)	2		2
Child (aged 6-12 years)	1		
Adult	5	1	

Table 5: TESCO wearer trial types and numbers of DSH garments supplied

Wearer Trial Results and Discussion

Skin symptoms and sleep disturbance

Before wearing DSH garments for 14 days, the participants were asked to assess their current skin condition on a Likert-scale of 1-5. The symptoms the participants were asked to assess were inflammation (redness), itch and effect on sleep. Normal or no symptoms was defined on the Likert-scale as 1; and the most severe symptoms/sleep disturbance, a Likert-scale of 5. The participants were then asked to record the same symptoms on the same Likert-scale, after wearing DSH garments for 14 days. The results showing before (day 0) and after (day 14) symptoms are presented in tables 6, 7 and 8 below. The participants either wore the garments during the day (two participants), at night (eight participants) or for 24 hours (one participant); one participant failed to complete this question.

Inflamed skin

A comparison of question 2a and 3a shows a shift towards the less severe end of the Likert scale. The number of participants who described their skin as normal after the 14-day wearer trial doubled from two to four. The two participants whose skin improved to a normal condition after the trial both suffer from eczema.

Prior to the start of the trial two of the participants categorized the inflammation of their skin at level 4 or 5 on the Likert scale. After the trial both of these participants recorded an improvement to level 3 on the Likert scale. The participant who moved from level 4 to 3 has eczema and the participant who moved from level 5 to 3 has both eczema and psoriasis. This participant went from having skin that is described as red, angry, sore and out of control to skin that is pink and occasionally irritable. Of the eight participants who started above level 1, four recorded no change and four recorded an improvement in the inflammation of their skin.

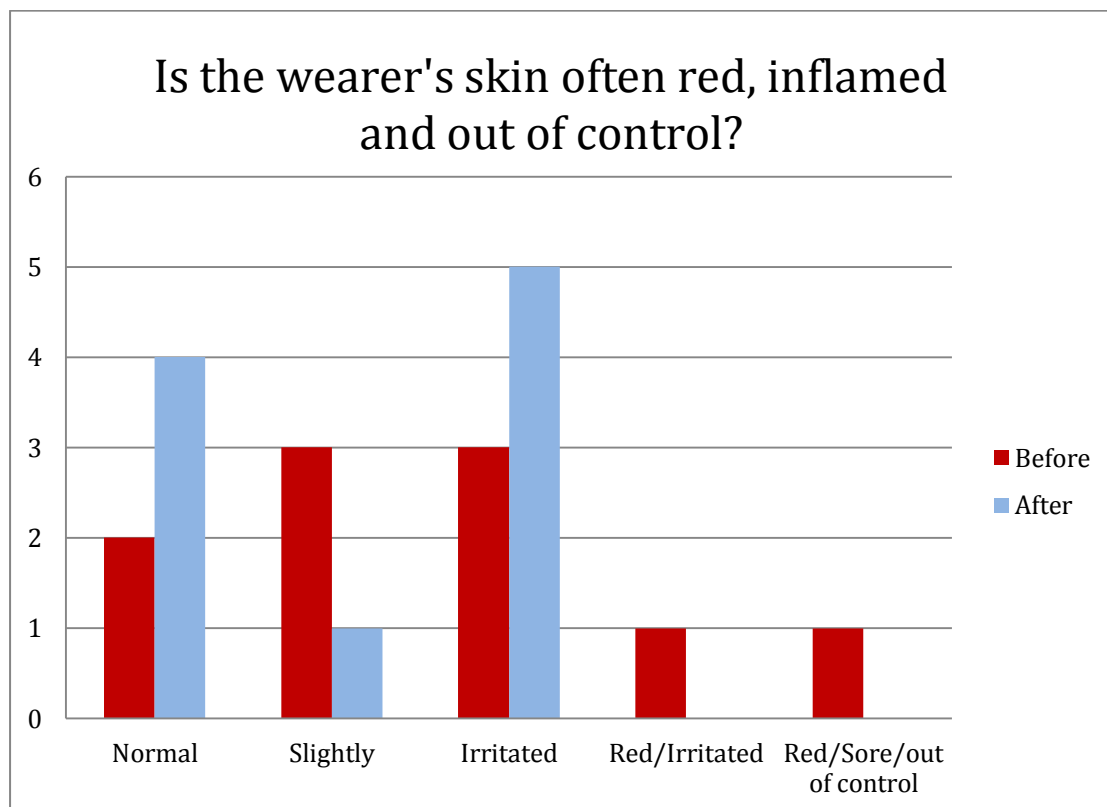


Table 6: TESCO wearer trial: Is the wearer's skin often red, inflamed and out of control? (One participant failed to complete this question)

Itchy Skin

A comparison of question 2b and 3b shows a shift towards the less severe end of the Likert scale. The number of participants who described their skin as normal after the two-week trial doubled from two to four. The two participants whose skin improved to a normal condition after the trial both suffer from eczema.

Prior to the start of the trial five of the participants categorized the itchiness of the skin at level 4 on the Likert scale, which denotes moderate itch with regular scratching. On completion of the trial four of these five participants recorded a reduction in itchiness, one moving to level 3, two moving to level 2 and one of the participants moving to level 1 on the Likert scale and now describing their skin as normal with no itch. Of the eight participants who started above level 1, three recorded no change in the itchiness of their skin and five recorded a reduction in the itchiness of their skin.

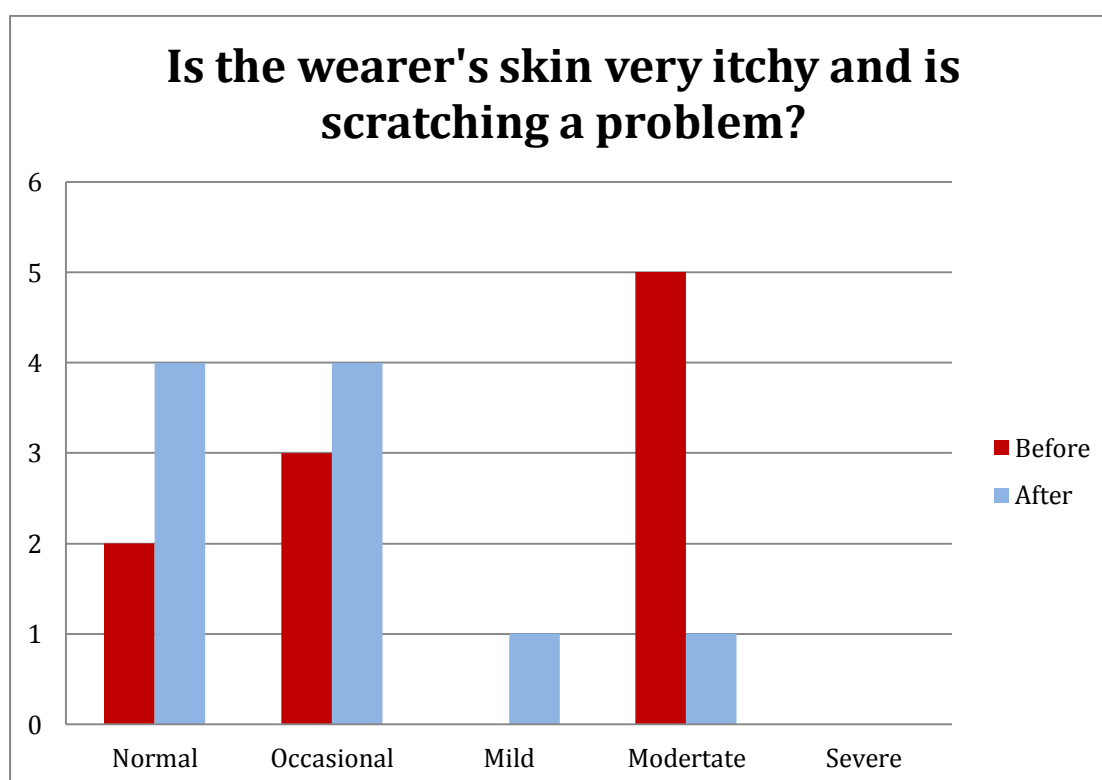


Table 7: TESCO wearer trial: Is the wearer's skin very itchy and is scratching a problem (One participant failed to complete this question)

Sleep

A comparison of question 2c and 3c shows a shift towards the less severe end of the Likert scale. The number of participants who stated that their skin condition had no impact on sleep improved, from four participants before the trial to seven participants at the end of the wearer trial.

Of the six participants who began the trial above level 1, three recorded no change and three recorded an improvement in sleep quality. Of the three who recorded an improvement in sleep, one has eczema and two suffer with eczema and psoriasis. All three improved to a normal state, one going from level 4 to level 1 on the Likert scale.

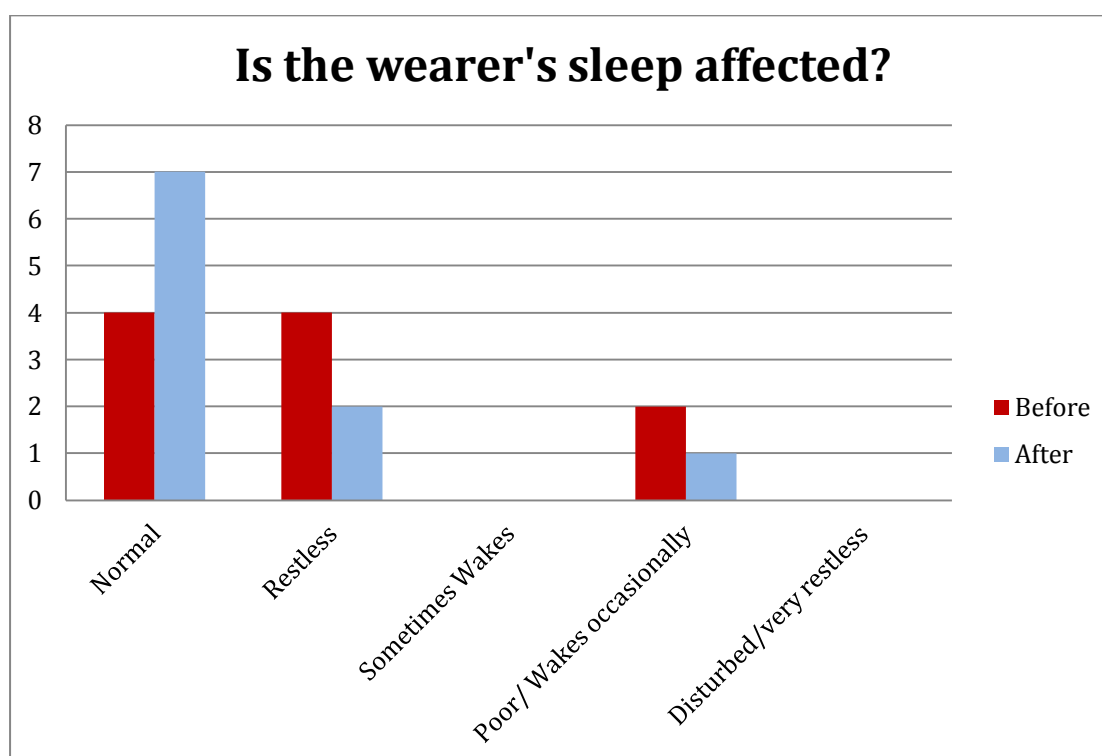


Table 8: TESCO wearer trial: Is the wearer's sleep affected? (One participant failed to complete this question)

Effect of DSH on skin condition

The participants were asked if wearing DSH garments had made a difference to their skin condition. The results are in table 9 below, one participant failed to answer this question.

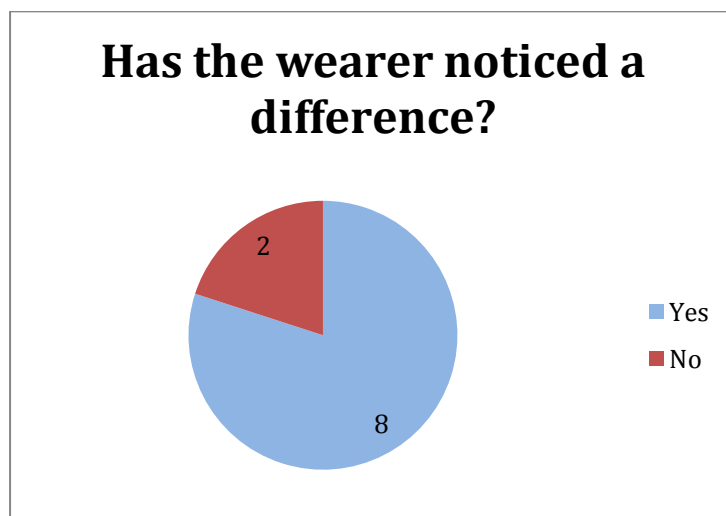


Table 9: TESCO wearer trial: Has the wearer noticed a difference?

Effect on skin irritation

No participants reported any irritation caused by wearing DSH garments

Effect on skin treatments

The participants were also asked if during the 14-day wearer trial period they noticed any change to their existing skin treatment regime. Of the eight participants with a diagnosed skin condition none reported that they used more treatment than usual, five used less treatment and three used the same amount of treatment. None reported that the existing treatments had any negative impact on the garments or vice-versa.

Garment care experiences

The participants were asked to describe their experiences of caring for DSH garments, including washing, drying and ironing.

Washing

The participants varied in the number of times they washed the garments. The range was once in 14 days to once a day, the majority of participants washed the garments 4-5 times during the 14-day trial period. Nine participants were provided with one garments and two children had two garments each for the 14 day wearer trial.

Eight participants chose non biological washing powder/liquid(brands used included Persil[®], Ariel[®] and TESCO[®] own brand) and three participants chose biological (Lenor[®] and Ariel[®]).

Eight participants chose to use fabric conditioners. The brands used were TESCO[®] Expert fabric conditioner and TESCO[®] own brand).

Ten of the participants washed the garments at 40-degrees and one at 60-degrees.

General participant comments on washing included:

‘Trial too short, need more time to evaluate washing.’

‘The garments remained soft, even without a fabric conditioner.’

‘They washed well, love the feel of the fabric.’

‘Good wash durability.’

‘Washed well and stayed soft.’

None of the participants mentioned any problems with shrinkage or deformation of the garments. Similarly there were no reports of a loss of softness or efficacy during the 14-day trial.

Drying

A variety of drying techniques were tested during the 14-day trial period. Two participants chose to tumble dry for the 14 days, on a hot temperature. The remaining nine participants chose to line dry (five participants inside and three participants outside).

There were no specific participant comments on drying.

Ironing

Two participants chose to iron the garments on a 3 dot, steam iron setting; the remaining participants did not iron the garments.

There were no specific participant comments on ironing.

Participant's comments on wearer trial

The participants were all invited to submit individual comments on their experiences of wearing and caring for DSH garments during the 2-week wearer trial:



Conclusions

The TESCO wearer trial included 12 people, five children (age range 0-12 years) and seven adults (age range from 20 - over 60 years). One adult (over 60 years) failed to complete the wearer trial (no reason was given for failure to return questionnaires). Of the eleven participants who completed the wearer trial, eight had a diagnosed skin condition (either eczema or psoriasis) and three had normal skin (with two of the participants with normal skin, describing their skin as dry).

After the 14-day wearer trial, all eleven participants had worn a DSH garment (either a top, bottom or for children under 5 years bodysuits), daily (two participants), at night (eight participants) or for 24 hours a day (1 participant). Nine participants had one garment, which they washed either daily or less often, depending on personal requirements over the 14 day wearer trial period. The children provided with bodysuits had two garments each.

The participants universally found the garments comfortable to wear, with none reporting skin irritation caused by wearing DSH garments. Measurement of skin symptoms and sleep disturbance showed very positive results.

There was evidence of skin inflammation (red, inflamed, out of control skin symptoms) being reduced after wearing DSH garments. Of the eight participants who started above level 1 on the Likert scale, four recorded an improvement in the inflammation of their skin. Of the four who recorded an improvement, two were participants who described their skin as red, angry and sore prior to the start of the trial. After the trial their skin had improved to being pink and only occasionally irritable.

There was evidence of the DSH garments ability to reduce the itchiness of the wearer's skin. Of the eight participants who started above Likert scale 1, five saw a reduction in the itchiness of their skin. Four of those who recorded an improvement started on Likert scale 4, which denotes moderately itchy skin causing regular scratching. One of these participants

who started on level 4, a patient with eczema, described their skin as normal with no itch after the trial.

Questions 2c and 3c asked the participants to rate their quality of sleep both before and after the trial. Three of the six participants who started the trial above Likert scale level 1 recorded an improvement in the quality of their sleep.

Out of the 10 participants who completed the question “has the wearer noticed a difference in their skin condition?” Eight reported a positive difference. Interestingly the two participants who answered no to this question recorded an improvement in at least one field of the questions based on the Likert scale.

The eight participants with skin conditions were asked if they noticed any change in skin treatment regimens. Five participants reported that use of their pre existing treatments reduced during the trial.

Garment care experience with the DSH garments was very positive. The majority of participants washed the garments at a 40-degree wash, four-five times during the 14 day wearer trial. There were no reports of any adverse effects of garment care; the garments all washed well, with no shrinkage or deformation of garments reported. The garments remained soft during the 14-day wearer trial. There were no adverse effects from tumble drying or ironing.

In conclusion, the TESCO wearer trial has shown in, a small but mixed group of children and adults with or without diagnosed chronic skin conditions, that DSH garments are comfortable, durable and easy to care for. They can also have a positive effect on skin irritation/redness, itch and quality of sleep. In all, ten of the eleven participants recorded some indication of improvement by either answering yes to ‘Has the wearer noticed a difference in their skin condition?’ and/or recording a reduction in severity in at least one of the questions based on the Likert scale.

Acknowledgements

TESCO® and DreamSkin Health® wish to thank staff members of F&F Clothing TESCO Group Commercial and members of their families for participating the TESCO wearer trial.

References

1. Data on File: DreamSkin Health Ltd
2. Data on File: DreamSkin Health Ltd

Appendix A.

DreamSkin Feedback Form (TESCO wearer trial).

Name/number.....Date:

This form has been devised to collect feedback from adults and children concerning their experience of the new TESCO DreamSkin clothing range

1. **Background information of the wearer:** Please fill in the following details

a. **Male** **Female** (tick relevant box)

b. Age range:
0-5years 6-12 13-18
20-40 40-60 60+

c. Does the wearer have a skin condition
Yes **No** (tick relevant box)

If no, circle the description that best describes your skin: **Oily** **Normal**
Dry

d. If you answered yes to question c:

Please indicate the wearer's skin condition:

Eczema **Dry Skin**
Psoriasis **Other.....**

For how long has the wearer suffered from this condition?.....

e. Skin Treatments; please indicate which treatments the wearer currently uses?

a. **Emollients (bath oils, soap substitutes/wash products and moisturisers. List products.....**

b. **Flare treatment for eczema e.g. Topical corticosteroids**

c. **Psoriasis treatments e.g. tar, vitamin D**

d. **Antibiotics**

e. **Bandages or wet wraps**

f. **Other types of clothing**

g. **Other treatments, please list.....**

2. Before using DreamSkin for 14 days, please indicate the wearer's symptoms on the following scales by answering the following questions:

- a. **Is the wearer's skin often red, inflamed and out of control?**
Circle number in the second row of the tables below

Normal skin (skin condition controlled)	Slightly pink in areas	Pink patches, which are irritated	Pink /red patches, becoming sore	Red, angry, sore (skin condition out of control)
1	2	3	4	5

- b. **Is the wearer's skin very itchy and is scratching a problem?**

Normal skin, no itch (skin condition controlled)	Occasional itch, minimal scratching	Mildly itchy, occasional scratching	Moderate itch, regular scratching	Severe itching and constant scratching (skin condition out of control)
1	2	3	4	5

- c. **Is the wearer's sleep affected by eczema symptoms?**

Normal skin, no sleep disturbance (skin condition controlled)	Restless at night but sleeps through night	Restless but sleeps, sometimes wakes	Sleeps poorly, wakes occasionally at night	Disturbed, very restless, wakes several times at night (skin condition out of control)
1	2	3	4	5

Date wearer trial commenced.....

Garment worn.....

Please wear your garments for 14 days (either day or night)

3. After using DreamSkin for 14 days, please indicate the wearer's symptoms on the following scales by answering the following questions:

a. Is the wearer's skin often red, inflamed and out of control?

Normal skin (skin condition controlled)	Slightly pink in areas	Pink patches, which are irritated	Pink /red patches, becoming sore	Red, angry, sore (skin condition out of control)
1	2	3	4	5

b. Is the wearer's skin very itchy and is scratching a problem?

Normal skin, no itch (skin condition controlled)	Occasional itch, minimal scratching	Mildly itchy, occasional scratching	Moderate itch, regular scratching	Severe itching and constant scratching (skin condition out of control)
1	2	3	4	5

c. Is the wearer's sleep affected by eczema symptoms?

Normal skin, no sleep disturbance (skin condition controlled)	Restless at night but sleeps through night	Restless but sleeps, sometimes wakes	Sleeps poorly, wakes occasionally at night	Disturbed, very restless, wakes several times at night (skin condition out of control)
1	2	3	4	5

**Of the treatments listed in question 1.e, is the wearer using any of them more or less now after wearing DreamSkin garments? More
Less**

d. Has the wearer noticed a difference between the area of the body where the garment was worn and the areas where the garment was not worn? Yes No

e. Did the wearer experience any irritation from the fabric or seams? Yes No

f. Additional comments.....

Date wearer trial concluded.....

Garment worn (please circle): Day Night Hours worn (per day/night).....

4. DreamSkin Garment care

Please machine wash DreamSkin garments at 40°, line dry or tumble dry at 3 dots, cool iron

a. **How many times did you wash your DreamSkin garments in 14 days?**.....

b. **What washing powder did you use? Biological /non biological** (please delete)

Please tell us the brand.....
.....

c. **Did you use a fabric conditioner?**
Yes/No.....

Please tell us the brand.....
.....

d. **What temperature/wash cycle did you use?**.....

e. **Did you tumble dry the garments? At what temperature?**
.....

f. **Did you line dry the garments? Outside Inside On a radiator**

g. **Did you iron the garments? At what setting/temperature?**
.....

h. **Any comments regarding washing, drying and durability of DreamSkin garments?**.....

5. Please add any further comments on DreamSkin garments and wearer experience

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On completion of the DreamSkin wearer trial, please return this completed set of forms to Rachael Collins.

Thank you very much for participating