

New research into hair control shows reduction in contamination and landfill

Hair is the most common food contaminant and it is a significant potential vector of *Staphylococcus aureus* contamination from the human scalp.

Merely discovering a hair in food can trigger a significant response in consumers. They lose their appetite, feel sick and do not buy again. Hair control in the food processing environment is both a food safety issue and a brand protection issue.

According to Brian Plunkett of The Oxford Hair Foundation, Queen's College, Oxford University, England every human being (who is not bald) sheds between 100-150 hairs every day at a constant rate. Over an eight hour shift, each employee is expected to shed between 33-50 hairs, so with 100 workers in a food processing operation they will lose between 3,300-5,000 potential contaminants. Both short and long hairs are shed at the same rate, however short hairs, being smaller, are often not seen as much.

Richard Burnet, the managing director of Aburnet, recently explained to International Food Hygiene that he was determined to raise the standard of hair containment in the food industry. "It has become apparent in recent years that traditional hair covering was not effectively solving the challenge of hair contamination."

He thought it essential that his company understood three things:

- Firstly, how hair sheds and moves under containment headwear.
- Secondly, what specialist technical fabrics could do to help control and contain the movement of hair.
- Thirdly, could Aburnet help food companies use regular, simple and user friendly

A traditional mesh hairnet.



Product wear trial at the University of Bolton, UK.

management tools to identify key aspects and record performance as a monthly KPI with corresponding corrective action.

Richard's company has therefore funded an independent research project conducted at The University of Bolton, England, which has just published some very interesting and useful findings.

- Hairs are often pushed up through head coverings due to the mechanical forces applied when fidgeting with head coverings, such as when adjusting them or scratching the head. This fidgeting increases in frequency when wearers are uncomfortable, for example when hot.
- Short hairs, with their tendency to stand upright, often appear through head coverings more commonly.
- Therefore, all hair, both short and long, needs to be folded over to lie flat against the head. This reduces the incident of hairs poking through fabrics.
- Hairs will poke through all fabric structures due to the inherent needle gaps in woven and knitted structures but more so in nonwoven spun fibre fabrics, such as those used in mob caps. This is because the fibres are randomly spun with no precise control possible.
- Two layers, where the inner layer expands and contracts greatly to hold the hair flat, whatever the head size and shape and hair style, combined with an outer layer

to grip and hold any hairs protruding through the fabric, such as those forced through by the mechanical action of rubbing/fidgeting or adjusting headwear, increase hair barrier performance.

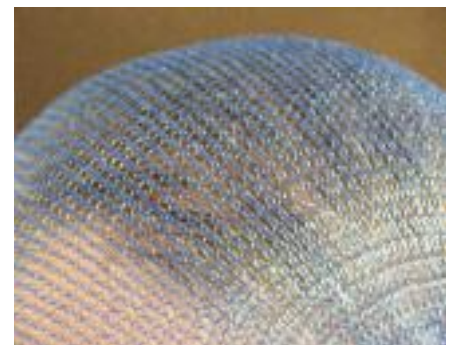
The research showed that such a combination will typically reduce hair loss by two to four fold, depending on the product combination worn.

Given that short hairs tend to stand more upright than longer hairs, short hairs tend to try to protrude through fabric more than longer hairs, and combined with the fact that they are less easily seen, together with the mechanical forces applied with scratching the head and/or adjusting headwear, short hairs present a bigger threat to food safety than longer hairs. This finding highlights the need for head coverings with a hair barrier technology, such as those developed by Aburnet which are patent pending and due for launch this year.

According to Professor Subhash Anand, MBE, Professor of Technical Textiles, Institute for Materials Research and Innovation, University of Bolton, England, "nonwoven materials, such as those used in mob and bouffant caps should not be used as a hair barrier fabric. Due to the nonwoven manufacturing methods of spinning the fibres, it is impossible to control the alignment and spacing of the fibres leading to a variable fabric structure with inherent gaps and different densities, allowing hairs to protrude through. Due to the fabric's rigidity, it will neither hold the head of hair nor grip strands of hairs that protrude through

Continued on page 22

The HairTite HygieNet works to grip and hold hair flat.



Continued from page 21

the fabric. It is a totally unsuitable material. This is evidenced in our wearer trials which proved that mob caps are the worst form of hair containment caps currently used in the UK food processing industry.”

So how do we progress from here?

The professor continued, “By first understanding how human hairs move when under headwear, we were able to direct Aburnet on the most effective attributes for a hair containment material and accordingly assisted them in developing new hair barrier materials to help reduce hair contamination in the food industry and other critical environments. With cost an important issue to the food industry, we looked at economical solutions, including the development of HairGon, a patent pending wash additive that dissolves unwanted hair during washing enabling the contamination-free, economical and eco-friendly re-use of headgear made from technical hair barrier fabrics.”

Working with leading food processors for two years, Aburnet learned what the industry wanted and combined this with the University’s technical direction to develop several new HairBarrier performance products. The first of these is a patent pending design called the HairTite HygieNet and was shown to International Food Hygiene during trials. It is designed and knitted to constantly work to hold the head of hair, keeping the hairs flat no matter the hair style or the

length. The research was carried out over a number of weeks using subjects selected to represent a significant cross section of hair types, lengths, sexes and ethnicities.

For statistical validity, the head was divided into eight zones with six separate judges (observers) taking great pains to count protruding hairs per zone over the whole head of each and every respondent/product combination trialled.

Recordings were noted for both initial wear and replicating a scratch of the head following standard wear guidance for consistency. Both traditional and the new design were tested and in total, 144 wearer results recorded per product combination worn.

Twice as effective

The results now published by the University clearly show that the new HairTite HygieNet is twice as effective at containing hairs when compared to a traditional hairnet (when worn under a mob cap), and at least four times more effective when worn under a mob cap than when using a mob cap solo.

This is particularly true for short hair styles, which were proven to be twice as likely to protrude through head coverings than longer hairs.

International Food Hygiene was reassured that these new design nets are being launched for the same price as the tradi-

tional design. The company has also launched free, simple to use web based tools such as downloadable ‘when and how to wear’ posters, staff training videos with optional competency testing, GMP best practice guidance and secure audit tools with time based graphic reporting.

These tools enable management to track key headwear aspects as KPI’s to direct and focus attention in key areas maximising results and resource efficiency. Users can log onto www.aburnet.co.uk and for full functionality, ask their distributor for a personal, confidential and unique access code.

Later in 2013 a new patent pending KleenCap design will be launched that will be compatible with HairGon. The new cap will not only increase the level of control, but, by washing with HairGon, it will also offer significant environmental benefits.

Nonwoven caps cannot be recycled and do not decompose, so there is a straightforward landfill saving of 90% compared to mob caps and a saving of 2,900 tons of carbon dioxide and 555 tons of crude oil. Add to that the potential to fully recycle the KleenCaps and a 100% saving is possible. If you compare the new design to a 12gsm mob cap weighing 3g, which is worn for only one day, then the 500,000 workers working for 235 days per year would save 352.5 tons in landfill each year in the UK food industry alone. ■

✉ info@aburnet.co.uk