Enhancing the properties of German wool by enzymatic modification

Esther Rohleder*[1], Heike Blank[2], Ina Sigmund[3], Lisa Schmitz[1], Mechthild Klein[1], and Maike Rabe[1]

[1]Forschungsinstitut für Textil und Bekleidung der Hochschule Niederrhein (FTB) – Germany
[2]FUSE GmbH – Germany
[3]Sächsisches Textilforschungsinstitut e.V. an der Technischen Universität Chemnitz – Germany

Abstract

Sheep farming is an important factor for coastal protection, landscaping and conservation of the biodiversity. Nevertheless, the number of sheep decreases in Germany. Currently, at least one third, about 2.5 mio. kg coarse and/ or colored wool, will not be used because appropriate products and marketing strategies are not existing. Although, the import of wool and sheep meat from southern hemisphere is growing, regional production and processing is gaining increasing importance in the clothing segment due to supply chain transparency, carbon footprint and consumer awareness.
The presented project EnzyWo aimed for the collection and processing of unused wool to high quality applications. Additionally, the basis for a local supply chain "from sheep" to a potential seller of wool-based products was established.

The preferred wool for production of textiles is white and fine, treated with felting free treatment to reach washability. The Chlor-Hercosett-process and variations thereof are still standard procedures, but environmentally friendly alternatives partially already exist. In the presented project, the coarse wool of different sheep breed was treated enzymatically to reach the market demands by Lanazym process. Aim of the modification of the fibers was a reduced felting behaviour as well as reaching a softer grip, maybe even a refinement of the fiber's diameter. Therefore, the wool of different sheep breeds in Germany was analyzed by characteristic fiber properties such as felting tendency as a marker for washability, fiber fineness as basic information for the spinnable yarn count and tensile strength to assess process stability before and after enzymatic treatment. The reachable effects on the wool were compared by variation of the intensity of the enzymatic treatment through reaction time.

These results were used by the project partners to scale up the research results from laboratory level to technical trials in spinning, dyeing and weaving processes.
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*Speaker