WOOL PROCESSING OUTCOMES AND OPPORTUNITIES

MIRCEA CONSTANTIN OPRÎȘ¹, DANA CORINA DESELNICU²

¹*A&D Pharma SRL, Romania, oprismircea0@gmail.com*

²*University Politehnica of Bucharest, 313 Splaiul Independentei, Romania, d_deselnicu@yahoo.com*

This paper provides an analysis of what happens with the sheep wool in Romania. Unfortunately, I found out that most of this “gold mine” is going to export, being processed, and then imported back for a much bigger price. The processing of sheep wool is not a very complicated process. There are processing lines that can take the sheep wool and by the end of the line, you get lanolin and fibers. Besides the very high margin that can be obtained from this type of business, motivation came from the idea of using our country resources at the maximum and try to have some products made in Romania. The main objective of this paper is to analyze the outcomes of a sheep wool processing line and the market in Romania. Sheep wool is a very precious raw material that can provide profit by processing it, having significant margins.

Keywords: wool processing, wool market, profit margin

INTRODUCTION

Wool

Wool is possibly the oldest fiber known to humans. It absolutely was one among the first fibers to be spun into yarn and woven into a material. Wool mostly comes from sheep but also alpacas, camels, and goats. Australia, Eastern Europe, New Zealand, and China are major wool producers. The American woolen industry began within the Massachusetts settlements in 1630, where each household was required by law to provide wool cloth.

Lanolin

Lanolin is extracted in the first stage of the sheep wool processing where it is washed (scouring) and then found in the residue. A typical high-purity grade of lanolin is composed predominantly of long-chain waxy esters (approximately 97% by weight) the remainder being lanolin alcohols, lanolin acids, and lanolin hydrocarbons.

An estimated 15000 different types of lanolin esters are present in lanolin, resulting from combinations between the 200 or so different lanolin acids and the 100 or so different lanolin alcohols identified so far. For this reason, the industry has a precise segmentation, depending on the use of lanolin.

Among other applications of lanolin, the most common of them are detailed below:

- It is often utilized in protective baby skin treatment and for sore nipples in breastfeeding mothers. It helps healing the skin and also gives decent hydration.
- Lanolin is used commercially in many industrial products starting from rustproof coatings to lubricants. Some sailors use lanolin to form slippery surfaces on their propellers and stern gear to which barnacles cannot adhere. The water-repellent properties make it valuable as a lubricant grease where corrosion would rather be an issue.
- Anhydrous liquid lanolin, combined with parabens, has been utilized in trials as artificial tears to treat dry and/or tired eye feeling.

<https://doi.org/10.24264/icams-2020.IV.16>

- Anhydrous lanolin is additionally used as a lubricant for brass instrument tuning slides.
- Lanolin may also be restored to woolen garments to create them water and dirt repellent, like for cloth diaper covers.
- Lanolin is usually employed by people on continuous positive airway pressure therapy to scale back irritation with masks, particularly nasal pillow masks that may often create sore spots within the nostrils.
- Lanolin may be a popular additive to mustache wax, particularly “extra-firm” varieties.
- Lanolin, when mixed with ingredients like neat’s-foot oil, beeswax and glycerin (glycerol), is used in various leather treatments, as an example in some saddle soaps and in leather care products.

Crude lanolin constitutes about 15% of the weight of freshly wool. The wool from one Merino sheep will produce about 250 of recoverable wool grease. This number can be obtained only from the Merino breed and has the highest lanolin in it.

Wool Fibers

Wool today is prized for its beauty and sturdiness. It's still the prime choice for high-quality business suits, warm sweaters, and premium carpets.

Most of the wool (72.8%) is used in apparel, while the rest of it in home furnishing, industrial uses, and other statistically insignificant small percentages.

The most important use of wool is in apparel coats, jackets, suits, dresses, skirts, slacks made up of woven fabrics of varying weights, and knitted fabrics.

In the home furnishing area, the major use of wool is in carpets and rugs where wool is used more, cover to the carpets, and warm in the rugs. Blends of different synthetic fibers with wool for suiting materials are increasingly important. This results in fabrics that are more appropriate in warmer conditions. Polyester is the most important fiber used in blending with wool.

As well-known already, the wool fiber is a very high performance one in the textile industry. It is largely used in professional risk takers and extreme sports athletes to protect them in any type of environmental condition. Wool can provide the following advantages:

- Thermo and moisture management: wool clothing can retain or release heat and moisture very well.
- Odor management: Wool clothing can reduce the amount of sweat on the body
- Resilience: wool fibers have a very high resistance on bending, up to 20.000 times, and also can stretch more than 30 percent of its own original size and shape.

Wool is very commonly used in newborns and baby clothing textiles. Some studies show the link between wool and wellbeing. This type of material assures the right body temperature. This happens because of its protein-based fiber made of keratin. Other materials do not have this ability. They also play an important role in the skin property of breathing, controlling humidity.

Figure 1. Moisture uptake of wool and other common fibers

As shown in Figure 1, wool has better water vapor uptake which leads to a higher grade of comfort to the user. This characteristic leads to better control of humidity which makes it a better choice for increased comfort of the textile.

Figure 2. The time needed for biodegradation for different types of material

Another big advantage of this type of material, as presented in Figure 2, is the fact that it is ecofriendly. It is considered biodegradable. Microplastic materials are one major source and they occur in the wastewater used for laundry. They then reach the seawater. Studies prove that the wool fiber starts decomposing after 21 days only in seawater.

Time required for textile materials of biodegradation:

- Cotton shirt requires 2-5 months;
- Wool sock requires 1-5 years;

- Nylon fabric requires 30-40 years;
- Leather requires 50 years;
- Rubber boot sole requires 50-80 years;
- Disposable diaper requires 450 years.

INDUSTRY INSIGHTS

The global lanolin market size was valued at USD 222.0 million in 2018 and is projected to expand at a Compound Annual Growth Rate of 6.0% from 2019 to 2025. Growth in end-use industries, like pharmaceuticals, personal care & cosmetics, and baby care products, is that the key factor driving the market. aside from cosmetics or pharmaceuticals, lanolin features a wide scope of applications in various industries. Over the years, research has led to an increased application in technical applications, like lubricants and therefore the production of anti-corrosion paints for ferrous materials.

Figure 3. North America lanolin market demand, by application 2014 to 2025 (tons)

As shown in Figure 3, the demand of lanolin has increased year by year and it is expected to have the same ascending trend up to 2025. The demand was segmented, and it was observed that the main application of lanolin was in personal care and cosmetics, of course, as a base material for these products.

REGIONAL INSIGHTS AND MARKET SEGMENTATION

Asia Pacific is anticipated to be the biggest and fastest-growing regional market. Rapidly expanding end-use industries, growing population, and increasing consumer awareness regarding bio-based and natural products are expected to drive the regional market over the forecast period. Rising expenditure on mass cosmetics and personal care products thanks to improving economic conditions in emerging countries like India, Vietnam, Thailand, and Indonesia will boost the expansion further. Similarly, the growing prevalence of lifestyle-related diseases is augmenting the demand for natural medicines, with lower or negligible adverse effects.

According to official reports of the Agriculture government in Romania, there are around 15 million living sheep and each one provides on average 6 kg of wool. The two

biggest competitors are handling only about 40% of this amount, while the rest of it is wasted.

Yet wool comprised only 1.26% of the world fiber market of 90M tons in 2013, according to the planet survey on textiles and nonwovens, The Fiber Year 2014, published by The Fiber Year Consulting. Approximately 60% of world wool production goes into apparel; with knits comprising 59%, and wovens 40%, according to wool marketing organization Australian Wool Innovation (AWI).

The retail value of wool apparel sold is around US\$80bn annually. With the worth of wool often averaging five to seven times as much as the price of cotton, wool is very much a premium product, increasingly confined to niche markets. In an era of artificial synthetics and fast fashion, has wool lost its relevance for the apparel business? Or is wool making a comeback as a 21st-century fiber, driven by improved aesthetics, performance aspects, and sustainability credentials?

The truth is that only a few of us actually understand wool in the context of textile fibers, and why wool is so unique. This report will examine the place of wool fiber in the textile value chain, addressing its decline in popularity through the second half of the 20th century, researching the explanations for its current comeback, and assessing future prospects for the wool industry.

Based on application, the lanolin market has been segmented into personal care & cosmetics, baby care products, pharmaceuticals, industrial, and others, like sports goods and humectants. In terms of revenue, the personal care & cosmetics segment accounted for 44.63% of the worldwide market share in 2018. the product has high moisturizing properties, thus features a tremendous demand in a form of cosmetics, additionally as baby care products.

While a number of the characteristics of wool are often altered through biotechnology of sheep, most of the modifications of design are implemented during the manufacturing of the fabric. Wool is blended with any number of natural or synthetic fibers, and various finishes and coverings may be applied.

CONCLUSIONS

In conclusion, even though the fibers are altered for the final using purpose, the sheep wool is used as presented, then mixed with other constituents. The best quality comes from the Merino breed, which can be found a lot in Romania. Mixing the fibers does not affect the business since it is used as presented for mixing afterward. In the last years, more and more attention was focus on eco-friendly materials. Wool fibers are the best compared in the industry. Other than wool fibers, there are many other exploitation opportunities of the sheep wool, like, lanolin, vitamin D3. Predictions for sheep wool industry are favorable with a 6% growth yearly, until 2025 which shows that the wool industry.

REFERENCES

- Benisek., L, Harnett., P.R. and Palin., M.J. (1987), "The influence of fiber and fabric type on thermophysiological comfort", *Melliand Textilberichte*, 68, 878-888.
- Brown, R.M. (1994), "The Microbial Degradation of Wool in the Marine Environment", thesis for the degree of Master of Science in Microbiology, University of Canterbury, New Zealand.
- Collie, S.R. and Johnson, N.A.G. (1998), *The benefits of wearing wool rather than man-made fiber garments*, Lincoln, Christchurch, New Zealand, WRONZ.
- Cone, L.G. (2009), "Minimize Heat Stress", *Chilton's Industrial Safety and Hygiene News*, 43(4), 39.

<https://doi.org/10.24264/icams-2020.IV.16>

Wool Processing Outcomes and Opportunities

- Eunomia (2016), “Plastics in the Marine Environment”, Eunomia Research & Consulting Ltd, Bristol UK, June 2016, <https://www.eunomia.co.uk/reports-tools/plastics-in-the-marine-environment/>
- Grand View Research (2019), “Lanolin Market Size, Share & Trends Analysis Report by Application (Personal Care & Cosmetics, Pharmaceuticals), by Derivative (Lanolin Alcohol, Cholestrin, Lanosterol), by Region, and Segment Forecasts, 2019 – 2025”, <https://www.grandviewresearch.com/industry-analysis/lanolin-market>.
- Mayo Clinic, Sweating and body odor symptoms & causes, <https://www.mayoclinic.org/diseases-conditions/sweating-and-body-odor/symptoms-causes/syc-20353895> (accessed 27/11/2018).
- National Oceanic and Atmospheric Administration Marine Debris Program, US Department of Commerce
- Wood, E. (2009), *Tangling with wool, A resource book of information and activities about wool and textiles*, AgResearch.
- *** <https://iwto.org/resources/statistics/>