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Why sheep don't shrink when it rains and answers to other questions about wool

Why Sheep Don't Shrink

A frequently asked question to sheep producers is why sheep don't shrink when it rains. While humor is obviously intended, there does exist an underlying question that has a real answer.

The "shrinking" that people have in mind is what happens to a wool sweater mistakenly put into the washing machine and/or dryer – resulting in a sweater of much smaller size. The technical term for this is called felting. In order to understand the process, a little background information on the structure of the wool fiber is needed.

Wool is made up of amino acids, the building blocks of protein. The protein in wool is keratinized or "hardened" during its formation and growth on the sheep. Fingers nails and hair are forms of keratinized proteins. The wool fiber is surrounded by flat, overlapping scales. These scale edges always point away from the body of the sheep while it is growing on the animal.

However, when processed, the fibers are mixed in their orientation and the scale edges may point in opposite directions. When spun into yarn, the wool fibers come in close contact with each other. Additionally, the fibers come into contact with each other when woven or knit into fabric. Therefore, the orientation of the fiber and subsequently the direction the scale edges are random.

When wool fabrics are subjected to agitation and moisture – the fibers in the fabric will slide past each other. However, the edges on the scales come in contact with each other, and do not allow the wool fiber to slide back, "locking" the fiber into position. It is not just one or two fibers that are locking together, but literally hundreds of fibers that come in contact with each other and lock into this position – causing the garment to "shrink".

In contrast, the scale edges point in one direction while on the sheep, and can slide back and forth – therefore not felting or shrinking. The sheep also produces lanolin that covers the fiber, which acts as a "lubricant" and water repellant. This can also have a small affect to reduce felting of the wool while on the animal.

But I can't wear wool – I'm allergic to it!

There are very few people that are allergic to wool. Wool is similar in chemical make-up to fingernails and hair. So if you are not allergic to your fingernails, you are probably not allergic to wool.

Research has demonstrated, that most fibers greater than 30 microns in diameter (a micron is 1/25,400th inches) are structurally rigid enough that when they come in contact with your skin, they do not bend – and cause a "poking" of the skin. The sensory receptors in your skin feel this poking and elicit a response. In some cases, this response is similar an allergic reaction on the skin where a redness or "rash" occurs. Some people have more sensitive skin than others, and react more. Most chemical fibers are made to be less than 30 micron in diameter, and therefore do not elicit this sensory reaction.

Wools garments designed to be worn next to the skin do not contain more than 5% of the wool fibers greater than 30 micron. The number of fiber ends exposed and touching the skin are low enough that the skin does not feel the poking sensation.

New technologies are being perfected that "tuck" the loose fiber ends into the yarn, so the end does not stick out and come in contact with the skin, therefore eliminating detection by the skin sensory receptors. Another new technology is to "stretch" the wool fiber, effectively thinning it out, making it less rigid – and having it bend when it comes into contact with the skin.

I'm not allergic to the wool - it's those chemicals and dyes

Another common misconception is that chemical compounds and dyes used to process wool cause an allergic reaction. While it is true that the wool industry uses chemicals during processing (for example mild detergents are used to clean the raw wool) – the unused portions are reclaimed after use. Wool fabrics are also washed and rinsed many times to remove any chemicals that would potentially remain. This is done before the wool leaves the textile mill. Textile worker safety and health issues are major concerns of the industry. The US government has strict rules and regulations regarding exposure to chemicals, which the mills must comply with. It would be nearly impossible for a fabric to leave a mill that contained any chemical residue that would cause harm to the next person handling the fabric – or the consumer purchasing a garment.

Also, with its unique chemical make up, the dyes used in wool are absorbed into the wool fiber itself, not simply onto the surface of the fiber. Once "inside", the dyes are not easily removed. The phrase "Dyed in the wool" was used to reflect that one maintained their principles, like wool maintained its color. Therefore it is also unlikely that dyes from wool are being released by the wool fiber causing an allergy.

Wool garments will fade over time when exposed to sunlight. It is the dye deteriorating and losing its color, not the wool fiber deteriorating.

Washable and Easy Care Wool

Today, the wool textile industry has developed processes to create easy care, washable wool fabrics. There are two basic processes used to create washable wool. One is to coat the fiber to allow the fibers to slide past one another. The other treatment is to subject the wool fibers to compounds that smooth out the edges of the fiber scales. The result for both treatments is a smooth fiber and with no prominent scale edges.

The United States Department of Agriculture and the American Wool Council are currently conducting research on the use of more environmentally friendly and less expensive methods to create washable wool.

Shearing is inhumane and causes the animal pain

The wool from sheep is an annually harvested fiber. The fiber is used in a number of ways from apparel to environmentally friendly products such as wool mats that absorb oil-spills. Wool is a continually growing fiber on the animal during its lifetime.

Domestic sheep with wool require annual harvesting called shearing. The wool fiber is a hardened protein, and does not contain any sensory structures. It is similar in chemical composition to human hair and fingernails. Therefore, the sheep does not "feel" anything when the wool is sheared, similar to when humans have their hair cut or a manicure.

Without shearing, the animal may potentially suffer due to excessive wool growth. Too much wool, or lack of shearing, may result in manure or feces accumulating on the wool and encouraging fly egg development. The resulting fly larvae can cause serious harm to the animal and eventually death through infection. Also, too much wool and the extra wool weight caused by lack of shearing can result in heat exhaustion or heat stroke during hot weather conditions.

Having said that, there is scientific evidence that shows sheep with 1 inch of wool are more comfortable during hot periods, compared to sheep with less wool, as the wool fiber dissipates heat from the animal's body more rapidly. Therefore, most sheep producers time their annual shearing to correspond with seasonal climate changes.

Shearing generally takes place in the spring when the temperature is warmer. This allows the sheep to have a full wool coat during the winter. And they have adequate wool growth to keep the animal cool and avoid sunburned sheep in the summer.

Sheep producers employ skilled tradesmen for the shearing of their sheep. To the untrained eye, it may look like the positions used during shearing are strenuous or hurt the animal; it is actually to the contrary. The positions used during shearing are actually very comfortable to the sheep. If the positions were not comfortable, the animal would struggle and fight to get away. Sheep shearers are very careful to make sure they maintain proper positioning of the feet and legs – for both the sheep and the shearer. Sheep shearers are schooled and trained in the proper techniques for animal handling, wool harvesting and animal care.

From a sheep production standpoint, it is in the sheep producer's financial interest to keep the sheep in a healthy and "happy" condition. Sheep that are stressed produce less desirable fiber, resulting in a lower economic return for the wool. Wool production is extremely sensitive to changes in nutrition; anything that can cause a stress or undue anxiety will have a negative affect on wool production. For this reason, sheep producers make sure that production practices employed do not negatively impact the animal's well being.

Lambs Wool and Virgin Wool

And finally, some words used in the wool trade for marketing of wool products may sound inhumane to the animal. For instance, boiled wool – refers to an additional processing step, where the wool fabric is boiled after the wool fabric has been woven; the animal is not "boiled" to obtain the wool. Lambs wool refers to the first harvesting of the fleece, which generally has a softer feel or touch to the fiber; the animal is not sacrificed to obtain this wool. Virgin wool refers to wool that has not been previously processed - it has nothing to do with the age of the animal at shearing or any lack of reproductive experiences of the sheep.