A recent study at the Polytechnic Institute of Wales confirms; wool is more comfortable than the equivalent in weight and construction of synthetic materials.

The physiological data showed that:

- The heart rate under wool was significantly lower 100% of the time.

2. The humidity next to the skin under wool was significantly lower 71% of the time.

3. The temperature rise of the skin above 91 degrees, considered the optimum level for comfort, was significantly higher under synthetic materials 80% of the time.

Results from a study at the Hohenstein Research Institute in Germany showed similar results. The findings illustrate that it is not just the construction of the material that makes wool the **best fiber to wear**, but that there is an **inherent benefit offered by the wool fiber itself**.

Due to wools physical structure and its natural chemical make up, **wool handles body moisture under warm and cool conditions** in a manner superior to any competitive cotton, down or synthetic fiber. Down and cotton have the additional disadvantage of losing their loft as they become damp.

Do you remember when you were a kid and you took your cold milk or your hot chocolate to school in a thermos bottle? At some point, you may have asked yourself “how does it know how to keep cold things cold and hot things hot”?

The answer to that question is the same answer as to why you will find Sherpa’s wearing wool on the coldest Himalayan mountain peaks and yet the Bedouins of the Sahara wear wool because it keeps them cool.

Wool is like a thermos bottle for your body.

How does it work?

Wool is warm in winter and cool in the summer because of its hydrophilic ability to wick away excess moisture. In the winter, wool removes moisture from the skin to

keep the wearer feeling warm and dry and wool's insulating qualities trap dry air and warmth near the skin. This is unlike synthetic fleece, which is warm but does not breathe easily. Wools natural insulating quality and its ability to shed water results in a fabric that keeps the body warm even when it is raining. In the summer, wool fibers coil-like shape pulls excess heat and moisture from your skin helping the wearer stay cooler.

Wool is naturally **water repellent.** Tiny overlapping scales encase the wool fiber like tiles on a roof. This allows wool to repel rain, snow and liquid spills with ease.

Wool is naturally **durable.** Laboratory tests have shown that wool fibers resist tearing and can bend back on themselves more than 20,000 times without breaking. Cotton breaks after 3,200 bends, silk fibers break after 1,800 bends, and rayon fibers break after just 75 bends. Wool clothing will last for years. Wool resists spills, dries very quickly and is mildew resistant.

Wool is naturally **wrinkle resistant.** Wool fabrics resist wrinkles. Wool is the most resilient fiber because it has a natural crimp that helps it keep its shape. Wool fibers can be stretched 70% beyond their length and still bounce back to their original shape.

Wool is **Renewable and Sustainable.** Wool is a renewable resource that can be shorn from sheep annually. It is biodegradable and kinder to the environment than oil-based synthetics, which contribute to global pollution. Wool is sustainable.

Wool is naturally **mildew and mold resistance.** Wool's natural resistance to mildews and molds comes from the way it repels moisture, and lets moisture pass through its fibers without holding the moisture. Mildews and molds require moisture to live and grow. Moreover, guess what; mold and mildew stink! This is why you can wear our wool jersey on ride after ride without washing it. Whereas that synthetic jersey *funk* we all know, can clear a room after just one ride.

The thing is that when you compare millions of years of evolution with a century of fabric and chemical engineering, synthetics just haven't hit all the bases yet, while being cheaper, mass producible, and easier to care for, they just don't meet the performance characteristics the user wants.

So what about these millions of years of evolution, what have mother nature and

sheep managed to produce that our better living through chemistry age can not yet match?

First let's look at a **single wool fibre** from one of Earth, Wind and Riders jerseys.

This is less then a thousandth of an inch thick (25% the size of a typical scratchy wool fibre) and is made up, like all wool, of three main layers. First there is a hydrophilic (water loving) core made of a protein called keratin, just like your very own skin and hair, and is designed to maintain the homeostasis (stable metabolic rate) of the body. The core is surrounded by overlapping cuticle scales (like shingles on a roof), which are very tough, waterproof and self-cleaning as well (when the fibre moves the scales brush against each other) and extremely UV resistant having a UV factor of UPF50+. These scales are what can make normal wool scratchy, but EWR'S wool being much finer (like silk) means that they're too small to irritate the skin. This scaly layer is then covered by a filmy skin called an epicuticle, which acts as the fibre's waterproof shell, causing water to run off and is the cause of water beading up on the surface of the jersey.

Sounds impressive doesn't it, a waterproofed fibre? Well that's just the begining. Synthetic fibres are just as waterproof, as they are basically plastic and so can't really absorb anything (hollow fibres can absorb 4% of their weight). The difference is that whereas synthetic fibres are 100% waterproof they are also non breathable, with their wicking abilities coming from the way they are woven or knitted together to make the fabric (and what hydrophilic/hydrophobic **toxic chemicals** they are treated with to boost their performance).

The secret of wool is that amazingly the fibres themselves breathe, with the outer epicutile layer and cuticle scales featuring tiny pores big enough to allow vapor through but not the larger water molecules.

This means that when you sweat the actual fibres soak up the moisture, not just the surface of the fibres. This moisture is absorbed into the protein core of the fibre, with the fibre being able to absorb up to 35% of it's weight. This is not to say that your wool jersey will take on a pound of water then stop working, as the same processes are at work as with synthetic fabrics, namely the moisture wicks out towards the surface pushed by your body heat. Your jersey will get heavier but because we're only talking about a very thin layer this isn't a problem.

What's important is how warm the fabric is when wet - not how quickly it dries in a lab. The actual insulation properties of wool comes both from its super fine three

dimensional 'sprung' structure (or crimp) which helps to maintain very resilient dead air spaces, wet or dry, which creates the perfect wet warmth environment to push the moisture in the fabric out across the temperature gradient on to the surface and eventually the atmosphere.

Probably the most amazing attribute of wool is that the wool isn't dead like plastic and will actively try to maintain your comfort level, dynamically trying to achieve an equilibrium with the surrounding environment, absorbing and desorbing moisture vapour in order to maintain this equilibrium. It sounds hard to believe but this last fact explains a lot and may explain why our wool jerseys actually feel part of you.

All of this is partly the reason why we warmly say . . .

Earth, Wind and Rider Jerseys; NO SCRATCH, NO SNIFF.

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