SUSTAINABILITY: QMILCH

A German start-up is working on a new version of casein, a fibre derived from milk protein, introducing a new production method that, it claims, avoids some of the fibre's traditional drawbacks.

Casein makes a comeback

What happens when a fashion designer and former biology student starts reading up on casein fibre to learn more out about the milk protein yarn's reputation for offering high skin compatibility? She decides to make it herself. "I grew up in East Germany, and if you wanted something special, you had to make it yourself," jokes Anke Domaske, an enterprising young woman who heads up both Mademoiselle Chi Chi, her fashion brand, and Qmilch, the name she has given to the casein fibre she is developing.

Ms Domaske began experimenting with some of the many recipes for casein two years ago, soliciting help from the Bremen Fibre Institute. At the end of 2011, her company was producing 15 kilos of Qmilch fibre per hour and had plans to reach 70 kilos per hour in the course of 2012 when the factory, currently under construction, is complete.

The Qmilch manufacturing process starts with dried organic milk powder, originating from Europe, but not fit for human consumption. "Approximately 20% of milk produced in Europe doesn't satisfy strict food standards and is considered waste," says Anke Domaske. Casein protein appears once the milk turns sour. Water is added to the casein and the mixture grounded into a fine paste. "It's comparable to making bread, the 'dough' has to be very smooth and uniform," says Ms Domaske. The pulp is pushed through a spinneret to form the fibre. Qmilch is currently produced in a single type, in 1.6 dtex and with a round cross-section. In the future, the company plans to produce varied cross-sections, including a grooved fibre that would enable faster wicking. The whole process takes only one hour and requires very little water; traditional casein fibre production entails more



Mademoiselle Chi Chi, Anke Domaske's fashion label, has a wide selection of garments made in Qmilch.

QMilk

COPYRIGHT WTP

chemicals, more water and more time—around 60 hours, according to Ms Domaske. As a result of this new production process, Qmilch is both biodegradable and GOTS certified (confirming its organic status)— few man-made fibres are accepted by the Global Organic Textile Standard.

Milk and water

Qmilch has all the makings of an organic fibre: "We use no products from the oil industry at any point in the process, the fibre is basically made of milk and water. The only chemicals we do use are to make casein insoluble in water," claims Anke Domaske. Maurice Calonnier, a textile engineer at the French Textile Institute IFTH, concurs: "Technically casein is not a natural fibre but it is extracted from the biomass and in that sense can be considered an eco-fibre, like PLA (polylactide)."

The innovative manufacturing process developed by Qmilch differs from conventional casein. According to the IFTH, the production process is similar to those used to make viscose and requires the addition of sulphuric acid. "Traditional casein is polymerised with acrylic, so that a 75%–25% acrylic-casein fibre is produced," says Ms Domaske. Milk fibres were first developed in the 1930s in Germany and Italy. The presence of acrylic is what gave the milk fibre a warm woolly hand.

The main casein fibre currently marketed in Europe is Milkofil, made by the Italian spinner Maclodio. The company sources the fibre from China, where it is produced using a viscose manufacturing process, and it is, like Qmilch, said to be extracted from organic milk. Andrea Ghio at Maclodio confesses that the fibre is not an easy sell: "Milkofil has many interesting properties but they are difficult to explain and buyers are increasingly cautious."

A wellness fibre

Milk fibre suppliers generally focus on two of casein fibre's common assets: the softness of the fibre and the presence of amino acids found in milk, which are apparently not destroyed by the production process. The amino acids could have an effect on maintaining healthy skin, according to Maclodio. Considered a skin-friendly fibre, casein would be ideal for sensitive skin. "It is a good option for people who have severe allergies," says Ms Domaske. "Tests have shown that Qmilch has a positive effect on wound healing and resists bacteria, even the highly pathogenic staphylococcus. Other properties include high absorbency, fast drying and low thermal conductivity, which makes it a good thermal insulator. Japanese casein fibre producer Toyobo also mentions the pleasant silk-like "scroop" sound it makes as the body moves.

On the down side, casein is generally blended with other fibres to increase wash-resistance and durability. The fibre is expensive and exclusive, which is why it is often used in blends with silk, and its natural yellowish tint makes white impossible to achieve, according to Toyobo.



Anke Domaske, fashion designer and Qmilch inventor.
QMilk

A natural industrial fibre

Derived from a milk protein, Qmilch is technically a protein fibre, and therefore similar to silk and wool, both natural protein fibres. The round fibre cross-section currently developed by Qmilch gives it a very smooth hand, similar to silk. Ms Domaske insists Qmilch has a much softer hand than traditional casein.

The key breakthrough, Anke Domaske says, is that Qmilch is "the first fibre that is both natural and industrial. We are continually trying out different recipes and cross-sections; the possibilities are endless." Close to 100 companies, including sports apparel suppliers, are currently testing Qmilch. Soft, antibacterial, non-allergenic and ecological, the fresh milk fibre seems worth a try, if not a taste.



The various stages of the Qmilch production process, from cheese to fibre to textile.
QMilk

COPYRIGHT WTP