



SUZANNE LEE,  
CCO OF MODERN MEADOW.  
PHOTO BY DANIEL MARTINEZ

# LEAVING LEATHER

Leather. Love it, leave it, or do both and make your own.  
Modern Meadow is paving the way for the high-tech  
future of leather in Fashion.

*By* MARIA KOWALSKA ELLEBERG

Humanity's love story with leather goes way back. You could argue that it all began with the Egyptians, somewhere around 5000 BC, or with the Areni-1 shoe, made in Armenia around 3500 BC. But then again, the early humans who lived during the Paleolithic era seemed to have had quite a thing for leather tools. Over thousands of years humans have learned to use animal hides to our advantage, exploring different techniques—some more pleasant than others (in Victorian London, dog dung and bird droppings were an essential part of the leather-making process)—to soften and preserve the skins.

With its durable qualities, leather has become a staple among the rugged, cherished by everyone from cowboys and aviators to Jim Morrison and your run-of-the-mill leather fetishists, giving it an undeniable bad-boy status. It's a headline-worthy material with significance—and the base of many iconic looks, like those of Marlon Brando and James Dean. And do you remember Nicolas Cage's snakeskin ensemble in *Wild at Heart*? There is even a website dedicated to the material, Leather

Celebrities, that showcases a collection of photos of famous people sporting a variety of leathery looks.

In the fashion world, nothing signifies luxury quite like a leather heritage: Many esteemed fashion houses take great pride in their craftsmanship. Today's \$100 billion leather industry uses more refined methods than those of Victorian times, creating unique leather finishes like patent or suede, and manufacturing anything from books and sports gear to designer bags. But this luxury comes at a high price. Leather goods demand the skin from an animal, and the breeding, caring for, and slaughtering of these animals is both environmentally unfriendly and, more often than not, cruel. Not to mention the fact that the people who tan the fabric—a crucial process that softens, preserves, and sometimes colors leather—often work in inhumane conditions and are exposed to carcinogenic chemicals.

Enter Modern Meadow, a Long Island-based tech company that biofabricates “leather” without



PHOTO BY SARA KINNEY, COURTESY OF MODERN MEADOW

involving any animals at all. The founders have backgrounds in biotechnology, and before starting Modern Meadow, they ran a business that used 3-D printing to transform human tissue into leather. The conception of Modern Meadow “was actually a provocation from the fashion industry,” says Suzanne Lee, the company's chief creative officer. “Fashion labels started asking if they could grow animal leather too.”

Lee, dubbed the best-known person in the field of biofabrication by the

*Wall Street Journal*, joined the company in 2014. She's no scientist, but rather comes from a solid fashion background. Her interest in biotechnology began in the early 2000s, when she started growing her own microbial materials in the bathtub and using them to design a series of eerily futuristic jackets—and she hasn't slowed down since. Today Modern Meadow has moved on from the nascent process of merely growing cells to a more refined and efficient fermentation process that creates collagen—the main

component in leather—by way of a specially developed yeast and sugar mixture. When the collagen is ready, it's purified, processed, and tanned.

“We don't use the chemically intensive part of tanning, when you dissolve away hair, flesh, and the fat of the animal,” Lee explains. “We just do the piece that preserves the collagen, then we do a re-tan. That's when you can add dye, moisturizers for the skin, and the final finishing.” The result is a product almost indistinguishable from ordinary leather.

“It is the closest thing to traditional leather in concept, but it's created in a completely new way,” Lee says. “We started thinking about traditional leather, but along the way we realized that when you're growing the material from the bottom up, you can create anything. The process starts with leather in a liquid form, and we've been exploring the possibilities: What if we spray the leather onto another surface? What if we paint with it? What if we print with it?”

In a not-so-distant future, Modern Meadow will announce

a few collaborations with well-known fashion and luxury brands. Everything is still very hush-hush, but it's easy to see why major designers would jump at the possibility to work with this material. Not only does it offer a cruelty-free option to leather in an industry where many consumers are choosing faux furs over mink or fox, but it also offers unexplored creative possibilities. And the fashion world loves breaking new ground.

“There are people in the fashion industry who are interested in technology and really looking to science for solutions to their issues,” Lee says. “We are talking with brands and designers to understand how we can help them rethink the creation of a shoe, a bag, or a piece of clothing using this kind of material technology.”

Late last year, Modern Meadow revealed its first consumer product through Zoa, the world's first bioleather materials brand, at the Museum of Modern Art exhibition “Is Fashion Modern?” They created a minimalist graphic T-shirt that has no seams at all.

The “leather” is integrated with the different fabrics, creating smooth, almost indistinguishable transitions between them.

“There was a sense that people expected us to create a handbag or a shoe, but we wanted them to challenge themselves about what leather could be or do,” Lee begins. “What if it was not just a material in its own right? What if we could use that material as a manufacturing technique? We used the liquid leather to join that T-shirt together instead of stitching it. The material can take all different forms. We could create a silk scarf with leather nanofibers. We could create the buckle on a belt with leather.”

When Lee is asked about the reaction to this new technology, she says, “People are fascinated by the possibilities of what the technology could mean. We wanted to help people understand what is coming down the line in terms of technology, making it more tangible so that the next generation of designers understands that this is something that is going to be exciting for them to use. [To help them] rethink what they are designing and making.”

It's easy to imagine that this kind of material will resonate well with millennials, a consumer group that more and more moves toward cruelty-free options for both fur and leather. And the interest has been huge; many young designers have already reached out to Modern Meadow.

“It's both exciting and challenging; we are not at a stage yet where we can give out yards of material to young designers,” Lee reveals. “One of the challenges in bringing a new technology to the fashion industry is that fashion wants things now. Fashion doesn't get research and development, we have to educate. These materials are going to come and be in everyone's hands at some point. But it takes years of development to get there, and millions and millions of dollars to refine the technology. The greatest learning for me, as a fashion person, is patience. It's frustratingly slow. The science behind it is incredibly complex; it's not something that we can turn around in six months. That's the reality of it. But when it does happen, it will keep improving as the years go by. This is just the start of a new age for biofabricated materials. We are just at the beginning.”

*modernmeadow.com*