Scientists breed goats that produce spider silk

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Goats that produce spider silk protein in their milk could enable researchers to collect large quantities of the silk. Image credit: National Science Foundation.

(PhysOrg.com) -- Researchers from the University of Wyoming have developed a way to incorporate spiders' silk-spinning genes into goats, allowing the researchers to harvest the silk protein from the goats' milk for a variety of applications. For instance, due to its strength and elasticity, spider silk fiber could have several medical uses, such as for making artificial ligaments and tendons, for eye sutures, and for jaw repair. The silk could also have applications in bulletproof vests and improved car airbags.

Normally, getting enough spider silk for these applications requires large numbers of spiders. However, spiders tend to be territorial, so when the researchers tried to set up spider farms, the spiders killed each other.

To solve this problem, Randy Lewis, a professor of molecular biology at the University of Wyoming, and other researchers decided to put the spiders' dragline silk gene into goats in such a way that the goats would only make the protein in their milk. Like any other genetic factor, only a certain percentage of the goats end up with the gene. For instance, of seven goat kids born in February 2010, three have tested positive for having the silk protein gene. When these transgenic goats have kids and start lactating, the researchers will collect the milk and purify the spider silk protein into "much, much higher quantities," Lewis said.

Other than their ability to produce the spider silk protein, the goats do not seem to have any other differences in health, appearance, or behavior compared to goats without the gene, the researchers said.

In the future, the scientists plan to incorporate the silk genes into alfalfa plants, which they say could produce even larger quantities of silk. They explain that not only is alfalfa widely distributed, it also has a high (20-25%) protein content, making it an ideal crop to produce silk protein.

More information: via: National Science Foundation