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Dog Tips

Can Fish Skin Heal Canine Eye Injuries?

The skin of the tilapia fish is rich in collagen and is increasingly used in both human and veterinary medicine to treat a variety of injuries and disorders.

Analysis by Dr. Karen Shaw Becker

STORY AT-A-GLANCE

- The skin of the tilapia fish is rich in collagen and is increasingly used in both human and veterinary medicine to treat a variety of injuries and disorders
- A veterinary ophthalmologist in Brazil is using tilapia skin to successfully treat eye injuries in dogs, especially flat-faced breeds
- An integrative veterinarian in California is using tilapia skin to treat animal victims of wildfires
- A veterinary team in Michigan treated a badly burned dog with Icelandic, descaled cod fish skins, which are high in omega-3 fatty acids and have anti-inflammatory and antibiotic properties that are important for healing and tissue regeneration

The skin of the tilapia fish is rich in collagen, which is why it is increasingly used in both human and veterinary medicine in applications such as burn bandaging and repair of abdominal hernias and even heart valves. Collagen stimulates cellular growth and aids in the generation of tissue. Tilapias have rapid growth rates and produce a high amount of collagen that is also high quality, throughout their lives.

Recently, a veterinary ophthalmologist in Brazil, Dr. Mirza Melo, tested tilapia skin to treat a very common canine problem, especially in **flat-faced (brachycephalic) dogs**: corneal ulcers and perforations.[1] Brachys' eyes are easily injured because they're so prominent.

Historically, corneal injuries have been treated by surgically placing a membrane made of horse placenta, which is also a collagen source, but not on the level of tilapia skin, over the affected area to help it heal. Unlike tilapia collagen, horse-placenta collagen quality and quantity vary depending on the animal's age, weight, and other factors.

'Scaffolding' for the Cell Regeneration Process

Melo first successfully used tilapia skin in 2019 to treat a severe corneal perforation in a Shih Tzu. She works with the Tilapia Skin Project at Brazil's Burn Support Institute and the Federal University of Ceará, and has begun testing a membrane, the acellular dermal matrix (ADM), which is made of pure collagen extracted from the fish skin. According to the Scientific American:

> *"The processed ADM resembles a thick sheet of paper. Veterinarians rehydrate it with saline solution before surgery, then lay it over a dog's corneal lesion and suture it into place, where it acts as scaffolding for regenerating cells."*[2]

Melo has used the technique to treat over 400 dogs, none of whom to date have shown signs of pain or developed post-surgical infections. In fact, they all healed quickly, with minimal scarring. Other successful corneal repair procedures involving horse placenta, grafting, or transplant, tend to result in scarring.

Sterilized Fish Skin Is Also Used to Treat Burns

Back in 2019, Melo wasn't the only veterinarian experimenting with the healing properties of fish skin. Dr. Jamie Peyton, Chief of the Integrative Medicine Service at the University of California Davis, also used fish skin to treat eight pets — four dogs and four cats — burned in California's Camp Fire. Peyton used the sterilized skin of tilapia fish.

He also used it in 2017 to heal the badly burned paws of two bears and a mountain lion, and more recently, a bear cub.

> *"We're trying to change burn care for animals," Peyton said in a news release. "Tilapia skins act as a dermal substitute that provides pain relief and protection and helps these wounds heal better."*[3]

The fish skin can be sutured to the burned area or used as padding inside a bandage. It actually transfers healing collagen to burned skin and reduces the frequency of bandage changes, which are very painful for burn patients.

The owners of the pets who received the treatment reported a positive change in their animals' comfort level and behavior shortly after the fish skin was applied. In the case of one dog, the pet parent noticed a dramatic change in behavior shortly after application, and new skin began to grow on the severely burnt area within five days — a process that normally takes weeks.

An added bonus is that if an animal decides to taste-test the new skin, there's no toxicity risk, which the mountain lion proved when he ate his fish skin bandage a few days after it was applied! According to Vet Voice, a publication of the Australian Veterinary Association:

> *"The skin is not designed to be a sole treatment for burns in animals but is a new development that could drastically change the way we manage and treat burns in animals."*[4]

Fish Skin Becomes Functional, Living Tissue

In Lansing, Michigan, a one-year-old **Rottweiler** named Stella miraculously escaped a housefire while her owners were away, but when she was brought to the emergency department at Michigan State University's Veterinary Medical Center, it was discovered she had second and third-degree burns over 10% of her body.[5]

The burns were across Stella's head, nose, ears, hind end, and sides, and in addition, the poor girl was suffering from severe smoke inhalation, thermal injuries to her trachea and lungs, and respiratory problems. She went on to develop ulcers and scarring in both eyes from fire exposure, and for two weeks, no one was sure she would survive the ordeal.

> *"Stella's will to live was amazing; she never quit fighting," Rose Wahl, one of the licensed veterinary technicians who was there when Stella arrived, told MSU Today. "Her resilience and strength have astounded everyone who has worked with her."*[6]

In the emergency center, Stella was immediately given intravenous (IV) fluids and pure oxygen to help her breathe. Once she was stabilized, soft tissue surgeons and ophthalmologists began caring for her wounds. Due to her significant respiratory injuries, the dog wasn't a good candidate for anesthesia, which made treating her burns a special challenge.

Thinking outside the box, the surgical team decided to try a nontraditional approach using Icelandic, descaled cod fish skins donated by a company that develops fish skin products for use with burn patients and in other medical procedures in both human and veterinary medicine.

The tissue of cod fish skins is high in **omega-3 fatty acids** and has anti-inflammatory and antibiotic properties that are important for healing and tissue regeneration. The surgeons were able to place the grafts on Stella using minimal sedation, which prevented further stress to her lungs, and also improved the way her burns healed. As reported in MSU Today:

> *"The descaling of the cod skins is what differentiates them from other fish grafts, such as tilapia. While scaled tilapia grafts, which gained national attention during the California wildfires earlier this year, are effective, they act more as an organic covering while the skin underneath heals itself.*
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> *According to [Dr. Brea] Sandness [a veterinarian and surgical resident at MSU], descaled grafts have been shown to stimulate the production of cells and become functional, living tissue. In Stella's case, these grafts, which can be changed as often as the burn requires, were absorbed by her body as new tissue grew into the graft."*[7]

Stella's full case study can be found **here**.

> *"Stella's case is an inspiration, and her grafts have the potential to be a new and highly effective treatment tool in the veterinary profession," Sandness said. "She's a living example that the fire within her burned stronger than the fire that injured her."*[8]

Sources and References

[1,2] Scientific American, October 1, 2023

[3] UC Davis Veterinary Medicine News Release, January 3, 2019

[4] Vet Voice, March 27, 2019

[5,8] ScienceDaily, May 23, 2019

[6,7] MSU Today, May 23, 2019