

Sharks and Rays: Myth and Reality

Week 4

Liver Dissection

Dr. Marcelo Carvalho: Now, looking more into the digestion of the shark, we can see that the liver is the dominant organ. Sharks that live in the open ocean, for example, may have livers that make up some 25 percent of their body weight, compared to sharks that live on the ocean floor, which have generally smaller livers. There are three main lobes to the liver: the right lobe, the left lobe, and a small central lobe.

If we cut away the liver to show the other digestive organs, we first cut through the small central lobe right near the gall bladder. The gall bladder is important because it houses bile produced in the liver, and then injected into the top of the intestine. Bile is very important in emulsifying fats, one of the functions of the liver. So, we can take away the liver by cutting away at its corners and cutting through the bile duct.

There are many reasons why the liver might be so big in sharks. One reason is that sharks don't have a gas bladder, as bony fishes do. The gas bladder in bony fishes regulates the depth at which they can swim. Sharks, not having a gas bladder, have another

mechanism to give them positive buoyancy, which is a very large liver. The liver of a shark is very big, and contains a lot of oil, which is lighter than water. This gives the shark some neutral buoyancy.

If we place the liver of a cow in water, we will see that it sinks to the bottom. If we do the same with a shark liver — this is one lobe of a dogfish liver extracted from the female that we dissected—we will see that it floats, because it contains a lot of oils and lipids, again, giving the shark positive buoyancy.