

**Presenter: Dr Steve Van Dyck – Senior Curator, Mammals and Birds (Biodiversity Program)**

**Topic: Marine Mammals – feeding adaptations**

Hi, my name's Steve Van Dyck and I'm the senior curator of mammals and birds here at the Queensland Museum and today I'm just going to talk about some feeding adaptations in marine animals; talking about the way that they deal with a very common animal that lives in the southern oceans, lives all over the world, in cool waters. This is the little animal we call the **krill**. Most people think it's quite small, but in fact they're really quite large prawn-looking animals.

And how do you deal with something so small when you've got to take huge quantities into your mouth? Well, there's a couple of ways you can approach this problem. I'm going to talk about whales – how whales do this – and also some seals. Now, in the whales, the cetacean, the order Cetacea, there are two sub-orders: those whales that have got teeth, often as big as this, as in a sperm whale. They're called odontocetes. 'Donto', is of course, anything to do with dentists, anything to do with teeth; orthodontist. So, a lot of the whales have got teeth but a lot of them haven't.

A lot of them have this bristly stuff, which if it hangs from your upper lip, looks a bit like a moustache, I guess; and those animals belong to the suborder **Mysticeti**. This material is the material that is used to help sift out millions and millions of these krill from the cold waters where they occur. And how do they do this? Well, these bits of baleen – they're made of keratin, a bit like our fingernails - and they're stacked side by side into a curtain, if you like. Now imagine all of those, stacked domino-like and laid in the top of the upper jaw.

Now here's a big part of this **baleen** from a blue whale. We can tell it's a **blue whale** because the baleen is always jet black. One side is **un-frayed**; the other side is very, **very furry**. You can see this from the single plate that I've taken off this – very, very furry and frayed on one side, and un-frayed on the other. Now, a blue whale will take into its mouth a huge amount of water, forty tonnes of water at a time, because the lower part of the skin of the jaw is pleated. So it takes a huge gulp of water and because this is hanging like this, from the upper part of the jaw, and the fraying part is inside, the animal pushes its tongue up like that, and all the water is forced out, squirts out, through that side, and of course, the little tiny krill, these things here, are left inside. So the animal can swallow that down in a huge lump and a blue whale will eat forty tonnes of krill in a single day. It's extraordinary.

Now, on the other side of the coin, we've got seals that have amazing adaptations for dealing with these same creatures. This seal here is an Australian fur seal, which eats mostly fish and squid and you can see the dentition is what you would expect from a carnivore, just a bit like a dog. But in this animal here, the **Crabeater seal**, there are spectacular adaptations in the teeth. This is half the jaw, the other half isn't here, but if you have a look at this jaw here, you'd wonder what are these amazing little **furrows** in the **cusps** of the teeth, making those teeth multi-cusped, if you like. Let me just tell you that a Crabeater seal does not eat crabs. A Crabeater seal eats krill and the way it does this is to take again, a large mouthful of water and krill, these little shrimps, close the mouth, pull the gums up, and force the water out through these tiny little furrows, these little cut marks in the teeth. The water shoots out as if in a sieve and then, of course, the krill can be eaten.

So just a couple of adaptations but amazing adaptations for animals to deal with a small and slippery customer like the krill.

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