

HOW DO ELEPHANT SEALS DRINK?

Elephant seals don't really drink water. Initially they get the fluids they need to survive from the food they eat.

Elephant seals have developed fantastic mechanisms for efficiently utilizing and conserving water. Newborn pups obtain the water they need from their mother's milk, which is more watery during early lactation. As lactation proceeds the milk becomes higher in fat content and lower in water content, helping the pup put on a thick layer of blubber in a brief time. The change in water content is also beneficial to the mother because she is drawing on her limited resources and does not have a lot of water to pass on to her pup.

Fasting elephant seals derive the water they require by metabolizing the fat stores. Just think! They are carrying everything they need to survive the fast in their blubber!

Elephant seals are a study in efficiency. While fasting they reduce the loss of water that would occur through evaporation of their breath by means of a countercurrent heat exchange within their nasal passages. The complex nasal turbinates, cooled by incoming air, condense and absorb moisture that would otherwise be lost during exhalation. The mature males are able to fast for up to 100 days, thanks in part to that big long nose! They conserve energy by being as inactive as possible and by entering into sleep apnea (sleeping without breathing), which reduces the amount of water that would otherwise be lost through respiration.

The food elephant seals eat contains less than 1% salt content. If some seawater is swallowed incidentally with the food they have very efficient kidneys that can absorb the water and eliminate excess salt. They produce a small amount of concentrated urine that has a salt concentration equal to or greater than seawater. Human kidneys are less powerful, producing urine that is always more dilute than seawater.

Summary:

Elephant seals do not really drink water. They get the moisture they need from the food they eat while at sea. While fasting they metabolize blubber to get the fluids necessary to carry on bodily functions. The complex nasal turbinate system in the nose helps capture and recycle moisture. By limiting their activity and entering sleep apnea, they further conserve the amount of moisture needed for respiration.

The need to conserve energy – and moisture – while on the rookery are very good reasons to respect these incredible creatures and do as little as possible to disturb them. Anything we humans do to alter their behavior requires them to use more of their limited resources.

For more information, check Marianne Reidman's book, *The Pinnipeds: Seals, Sea Lions, and Walruses*. Also, see the "Diet and Digestion" section of *Mirounga*.