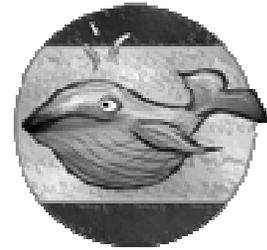


Mystery Meat Background Information



The Status of Whales

Among the mammals that live in the sea (seals, sea lions, walruses, sea otters, manatees, dolphins, and whales), whales may be the most familiar. Whales are very closely related to dolphins. As a result of their close relationship, scientists classify species of whales and dolphins together in the group *Cetacea*.

The number of whales has dramatically declined over the last several centuries, mainly due to hunting. These large animals are important parts of ocean ecosystems and they are also highly intelligent. Therefore, their demise is a concern for many citizens, fishermen, biologists, policy makers, and politicians around the world.

Great efforts have been made to help restore healthy populations of different whale species. One major goal has been to reduce the number of whales hunted and sold as meat and other products. In 1982 the International Whaling Commission (IWC) voted to stop commercial whale hunting to allow whale populations to recover. This moratorium went into effect in 1986 and made it illegal to hunt whales for the purpose of selling products derived from their bodies. Under the IWC treaty, permits for scientific study and for subsistence use by aboriginal peoples (original inhabitants) allow for a limited number of whales of various species to be hunted. The portions of whales taken for scientific study that are not used may be legally sold for commercial use, whereas those taken for aboriginal subsistence use may not be sold commercially.

Though the suspension went into effect in 1986, whale meat can be purchased in fish markets across the globe, particularly in countries where there have been long traditions of eating whales. In addition to legal hunting, instances of illegal whale poaching have come to light since 1986.

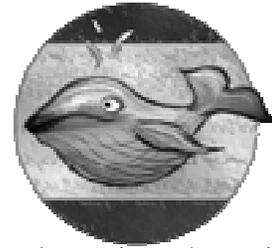
Additional Resources

American Cetacean Society: <http://www.acsonline.org/education/index.html>

This site has all sorts of information on whales and dolphins, including a great section on the IWC (<http://www.acsonline.org/issues/whaling/index.html>).

The IWC (International Whaling Commission): <http://www.iwcoffice.org/index.htm>

Another site with a lot of information on whales, particularly on legal issues, but also a great deal on conservation and management.



Mystery Meat Background Information

DNA Barcoding

Not too long ago it would be impossible to check the meat in markets to determine what animals it comes from. But with modern DNA technology, it is getting easier to use genetic data to identify organisms since each species has its unique **DNA barcode**.

Like the barcodes at grocery stores that identify food products and their prices, DNA barcodes can help identify species when only a part of the animal (or plant, etc.) is available. A short standardized position in the genome – a DNA barcode – allows an organism to be identified because different species have distinct gene sequences. Not only can these DNA barcodes show what species the product likely comes from, but in some cases they can identify the specific region of the world where the animal was probably captured.

The basic process of DNA barcoding is quite simple. DNA is taken out of a small bit of muscle, blood, feather, hair, etc. Then, a process known as PCR is used to make many copies, or amplify, a small specific region of DNA. Most often this target region is part of the mitochondrial genome. The most important attributes of the barcode region are that it is easy to amplify and that it evolves fast enough so that it differs in two different species, but slow enough that it is nearly identical within a species. When one gets the DNA barcode, it can then be compared to a large database of barcodes taken from known species that have been identified using their whole bodies. The outputs of these comparisons come in two forms, as a tree showing how close the unknown barcode clusters with barcodes taken from known species, and as a table showing the percent similarity of the unknown barcode to those of known species. A perfect match is 100 percent similar. In the small example shown here, the unknown is identified as Species 2.

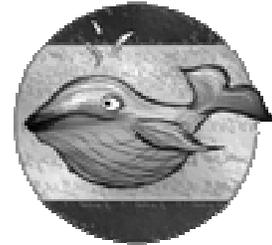


Additional Resources

Consortium for the Barcode of Life: <http://barcoding.si.edu/> This site contains information on “DNA barcoding”, the use of a short gene sequence from a standardized region of the genome to identify species.

DNA Techniques: <http://www.dnai.org/b/index.html?m=2,5> This site guides you through the steps of DNA amplification (making many copies of DNA), PCR (polymerase chain reaction) techniques, and gel electrophoresis.

**Mystery Meat
Background Information**



Data Table: Hunting Status of Whales

Catch limits for all types of whales was set to zero starting in 1986.

<i>Type</i>	<i>Catch limit allowed for aboriginal use between 2003-2007</i>	<i>Catch recorded using a Scientific Permit (1986-2005)</i>	<i>Catch limit for commercial use since 1986</i>	<i>Whale Population Estimates</i>
Fin	Yes 2003-2007: 19	1989: 68 2005: 10	0	N. Atlantic 1996-2001: 30,000
Minke	Yes 2003-2007: 187	1986: 69 Each year 1987- 2004: 250-630 2005: 1,117	0	S. Hemisphere 1982-1989: 761,000 N. Atlantic 1996-2001: 174,000
Humpback	Yes 2003-2007: 20	None granted	0	West. N. Atlantic 1992-1993: 11,570 S. Hemisphere 1988: 10,000
Gray	Yes 2003-2007: 620	None granted	0	East. N. Pacific 1997-1998: 26,300 West. N. Pacific 2006: <=100
Bowhead	Yes 2003-2007: 280	None granted	0	2001: 10,500
Sperm	None granted	2003: 10 2004: 3 2005: 5	0	
Sei	None granted	2000: 5 2001: 8 2002: 5 2003: 50 2004: 100 2005: 100	0	
Brydes	None granted	1998: 1 2000: 43 Each year 2001-2005: 50	0	
Pilot	None granted	None granted	0	1989: 780,000
Blue	None granted	None granted	0	S. Hemisphere 1996: 1,700