

Table S1: Hydrodynamic model predictions of maximum roll velocity of fin whales

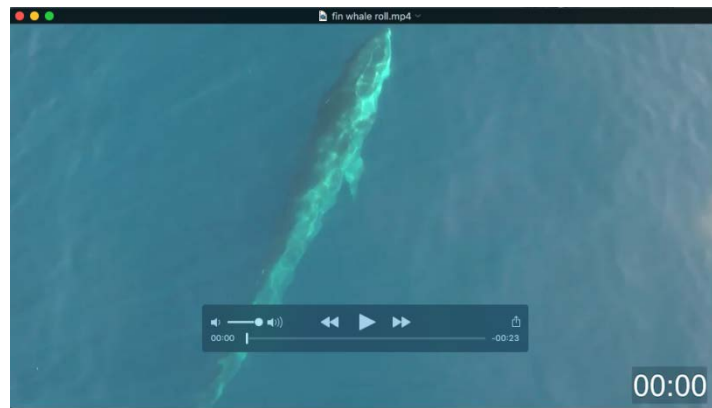
base-to-base cones model				
roll angle	maximum angular velocity at a given speed (°s⁻¹)			
	1 m s⁻¹	2 m s⁻¹	3 m s⁻¹	4 m s⁻¹
15°	8.2	16.5	24.7	33.0
45°	14.3	28.5	42.8	57.1
75°	18.4	36.9	55.3	73.7
105°	21.8	43.6	65.4	87.2
135°	24.7	49.4	74.2	98.9
165°	27.3	54.7	82.0	109.3

ellipsoid model				
roll angle	maximum angular velocity at a given speed (°s⁻¹)			
	1 m s⁻¹	2 m s⁻¹	3 m s⁻¹	4 m s⁻¹
15°	7.1	14.3	21.4	28.5
45°	12.4	24.7	37.1	49.4
75°	16.0	31.9	47.9	63.8
105°	18.9	37.8	56.6	75.5
135°	21.4	42.8	64.2	85.6
165°	23.7	47.3	71.0	94.7

cylinder model				
roll angle	maximum angular velocity at a given speed (°s⁻¹)			
	1 m s⁻¹	2 m s⁻¹	3 m s⁻¹	4 m s⁻¹
15°	6.4	12.8	19.1	25.5
45°	11.1	22.1	33.2	44.2
75°	14.3	28.5	42.8	57.1
105°	16.9	33.8	50.7	67.6
135°	19.1	38.3	57.4	76.6
165°	21.2	42.3	63.5	84.7

Table S2. Data for 1674 rolls of >45°, performed by 21 fin whales. The whale identifier, degrees rolled, degrees rolled during the acceleration phase, maximum roll velocity, and average swimming speed during the acceleration phase with upper and lower bounds, are presented.

[Click here to Download Table S2](#)



Movie 1. Aerial view of a fin whale performing a $\sim 90^\circ$ surface roll while lunge feeding. As the roll is initiated the flippers are adducted and thus obscured by the body. In this position one or both flippers may be used to generate asymmetric lift but their orientation would not be visible by the camera. Video courtesy of Wes Arnold, CineAire Aerial Videography.