

Supplementary Data

Table S1. Mean \pm SD fatty acid levels (mass % of total) for blood components from Bristol Bay belugas (BBB, n=9) and oceanaria-based belugas (OBB, n=14)

FA	BBB - RBC	OBB - RBC	BBB - WB	OBB - WB	BBB - Plasma	OBB - Plasma	BBB-Blub	OBB-Blub	OBB-DBS	OBB - Diet
<i>Saturated fatty acids (SFA)</i>										
C14:0	0.36% \pm 0.06%	0.60% \pm 0.12%	0.74% \pm 0.00%	1.53% \pm 0.00%	1.17% \pm 0.29%	2.20% \pm 0.39%	4.53%	8.06%	1.06%	5.17% \pm 3.00%
C15:0							1.63%	0.84%		
C16:0	11.79% \pm 0.45%	13.62% \pm 0.52%	10.48% \pm 0.00%	11.54% \pm 0.01%	10.05% \pm 0.48%	10.63% \pm 0.78%	9.87%	8.20%	12.49%	16.49% \pm 1.36%
C17:0	2.41% \pm 0.25%	1.40% \pm 0.39%			0.47% \pm 0.05%	0.41% \pm 0.04%	0.44%	0.43%	0.67%	
C18:0	25.61% \pm 0.71%	18.71% \pm 2.28%	15.99% \pm 0.02%	11.07% \pm 0.01%	9.01% \pm 1.19%	7.35% \pm 0.79%	3.84%	2.94%	12.68%	2.87% \pm 0.19%
C20:0	0.64% \pm 0.06%	0.56% \pm 0.05%	0.84% \pm 0.00%	0.75% \pm 0.00%	0.38% \pm 0.10%	0.31% \pm 0.06%	0.30%	0.20%	0.52%	
C22:0	0.43% \pm 0.06%	0.19% \pm 0.07%	0.47% \pm 0.00%	0.20% \pm 0.00%	0.05% \pm 0.01%	0.03% \pm 0.01%	0.09%	0.05%	0.35%	
C24:0	0.68% \pm 0.12%	0.16% \pm 0.09%	1.00% \pm 0.00%	0.19% \pm 0.00%	0.01% \pm 0.01%	0.01% \pm 0.01%	0.16%	0.03%	0.20%	
<i>Monounsaturated fatty acids (MUFA)</i>										
C16:1n7t	0.37% \pm 0.02%	0.56% \pm 0.09%	0.56% \pm 0.00%	1.55% \pm 0.00%	0.85% \pm 0.25%	2.40% \pm 0.20%	0.84%	0.97%	1.65%	
C16:1n7	1.98% \pm 0.22%	1.70% \pm 0.27%	5.63% \pm 0.00%	5.08% \pm 0.01%	9.50% \pm 0.87%	7.32% \pm 0.81%	15.67%	21.95%	5.83%	7.55% \pm 0.35%
C18:1t	0.27% \pm 0.08%	1.14% \pm 0.49%	0.32% \pm 0.00%	0.32% \pm 0.00%	0.37% \pm 0.15%	0.33% \pm 0.02%	0.29%	0.15%	0.80%	
C18:1n9	15.19% \pm 0.97%	12.31% \pm 0.95%	21.23% \pm 0.01%	22.87% \pm 0.01%	27.97% \pm 1.28%	28.11% \pm 1.78%	30.16%	28.80%	24.00%	19.32% \pm 2.70%
C20:1n9	0.98% \pm 0.40%	8.20% \pm 3.44%	0.94% \pm 0.00%	5.99% \pm 0.02%	0.84% \pm 0.53%	5.02% \pm 2.07%	3.96%	7.64%	2.64%	11.70% \pm 1.62%
C22:1n9	0.24% \pm 0.19%	4.45% \pm 1.50%	0.14% \pm 0.00%	2.39% \pm 0.01%	0.10% \pm 0.09%	1.40% \pm 0.62%	1.31%	4.34%	1.15%	15.53% \pm 2.36%
C24:1n9	1.64% \pm 0.19%	1.61% \pm 0.21%	2.32% \pm 0.00%	2.04% \pm 0.00%	0.58% \pm 0.12%	0.42% \pm 0.08%	0.50%	0.36%	1.07%	
<i>Polyunsaturated fatty acids (PUFA)</i>										
C18:2n6t	0.19% \pm 0.03%	0.34% \pm 0.06%	0.21% \pm 0.00%	0.16% \pm 0.00%	0.26% \pm 0.02%	0.20% \pm 0.02%	0.46%	0.48%	0.19%	
C18:2n6	0.51% \pm 0.08%	0.72% \pm 0.14%	0.68% \pm 0.00%	1.09% \pm 0.00%	1.01% \pm 0.21%	1.42% \pm 0.34%	1.10%	1.19%	1.08%	1.00% \pm 0.17%
C18:3n3	0.02% \pm 0.01%	0.03% \pm 0.02%	0.06% \pm 0.00%	0.12% \pm 0.00%	0.13% \pm 0.06%	0.22% \pm 0.07%	0.41%	0.54%	0.10%	0.41% \pm 0.04%
C18:3n6	0.08% \pm 0.01%	0.06% \pm 0.01%	0.12% \pm 0.00%	0.08% \pm 0.00%	0.21% \pm 0.04%	0.14% \pm 0.04%	0.15%	0.11%	0.15%	
C20:2n6	0.11% \pm 0.02%	0.09% \pm 0.02%	0.08% \pm 0.00%	0.12% \pm 0.00%	0.07% \pm 0.02%	0.05% \pm 0.02%	0.47%	0.48%	0.18%	
C20:3n6	0.22% \pm 0.03%	0.26% \pm 0.03%	0.21% \pm 0.00%	0.25% \pm 0.00%	0.18% \pm 0.02%	0.22% \pm 0.03%	0.09%	0.12%	0.26%	
C20:4n6	22.05% \pm 0.86%	12.16% \pm 3.86%	16.01% \pm 0.02%	7.08% \pm 0.03%	11.51% \pm 2.38%	4.62% \pm 2.24%	2.42%	0.78%	10.20%	0.47% \pm 0.09%
C20:5n3	11.11% \pm 0.33%	16.15% \pm 1.28%	9.74% \pm 0.01%	14.81% \pm 0.00%	9.30% \pm 1.03%	14.57% \pm 2.10%	5.09%	3.07%	14.73%	10.09% \pm 0.09%
C22:4n6	0.16% \pm 0.02%	0.03% \pm 0.01%	0.20% \pm 0.00%	0.05% \pm 0.00%	0.21% \pm 0.05%	0.05% \pm 0.02%	0.21%	0.11%	0.05%	
C22:5n6	0.17% \pm 0.02%	0.02% \pm 0.01%	0.29% \pm 0.00%	0.07% \pm 0.00%	0.30% \pm 0.06%	0.07% \pm 0.02%	0.45%	0.13%	0.08%	
C22:5n3	1.01% \pm 0.15%	1.08% \pm 0.15%	2.44% \pm 0.01%	3.16% \pm 0.01%	3.34% \pm 1.03%	3.82% \pm 1.00%	3.84%	2.78%	2.57%	0.98% \pm 0.05%
C22:6n3	4.20% \pm 0.46%	3.81% \pm 0.42%	9.30% \pm 0.02%	7.54% \pm 0.01%	12.60% \pm 1.49%	8.69% \pm 1.02%	11.98%	4.86%	5.28%	8.42% \pm 0.48%
O3I	15.31% \pm 0.72%	19.96% \pm 1.32%	19.05% \pm 0.02%	22.35% \pm 0.02%	21.90% \pm 1.28%	23.26% \pm 1.93%	17.07%	7.93%	20.01%	

TableS2. Mean percent of fatty acids in composite diet from percentage of FA in fish fed, example OBB_SWC

	Mackerel	Herring	Capelin	Composite
Fatty acid	5%	50%	45%	
C14:0	4.9%	4.8%	5.1%	4.93%
C16:0	17.3%	19.1%	9.2%	15.79%
C16:1n7t	3.2%	0.4%	0.2%	0.44%
C16:1n7	2.8%	6.3%	9.0%	0.00%
C18:0	7.2%	3.1%	1.9%	2.81%
C18:1t	0.5%	0.4%	0.7%	0.52%
C18:1n9	10.6%	25.1%	5.6%	18.38%
C18:2n6t	0.7%	1.1%	0.6%	0.93%
C18:2n6	1.4%	0.5%	1.8%	0.96%
C18:3n6	0.3%	0.1%	0.1%	0.09%
C18:3n3	0.6%	0.5%	0.2%	0.40%
C20:0	0.4%	0.4%	0.3%	0.32%
C20:1n9,11	2.8%	7.2%	19.3%	11.02%
C20:2n6	2.3%	1.3%	1.0%	1.26%
C22:0	0.2%	0.1%	0.0%	0.07%
C22.1n9,11	3.3%	8.9%	26.6%	14.60%
C20:3n6	0.2%	0.2%	0.1%	0.15%
C20:4n6	3.9%	0.6%	0.1%	0.50%
C24:0	0.1%	0.0%	0.0%	0.04%
C20:5n3	8.4%	9.4%	10.2%	9.61%
C24:1n9	0.4%	0.7%	0.6%	0.64%
C22:4n6	0.6%	0.0%	0.0%	0.04%
C22:5n6	1.4%	0.1%	0.0%	0.11%
C22:5n3	2.7%	0.9%	1.0%	0.97%
C22:6n3	23.8%	8.7%	6.3%	8.29%

Figure S1. OBB diet percentages based on fish type, per location, SeaWorld of California (SWC), SeaWorld of Texas (SWT), and SeaWorld of Florida (SWF). Whisker plots with quartile and median values.

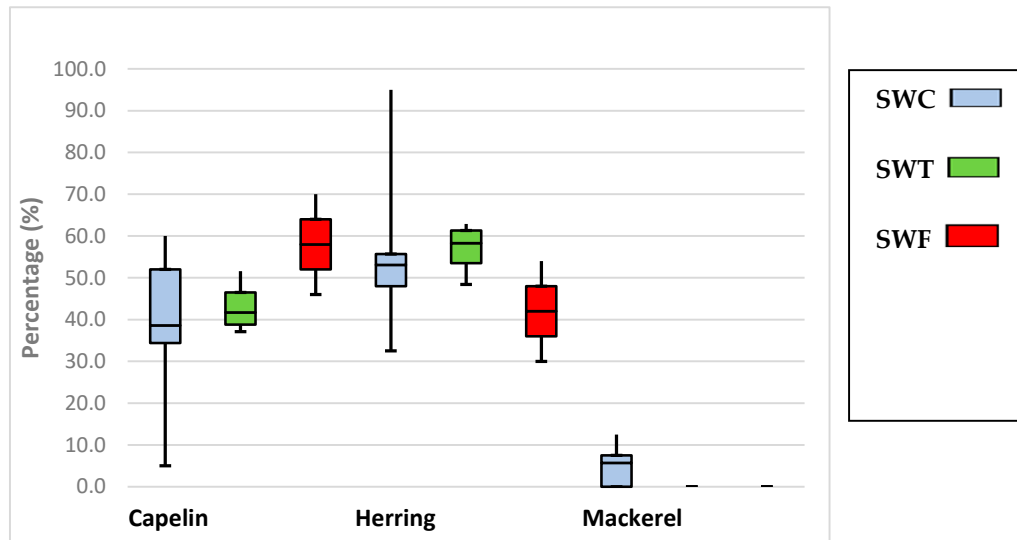


Figure S2. A comparison of mean fatty acid patterns in 30 random samples of human blood comparing whole (liquid) blood (WB) to dried blood spots (DBS).

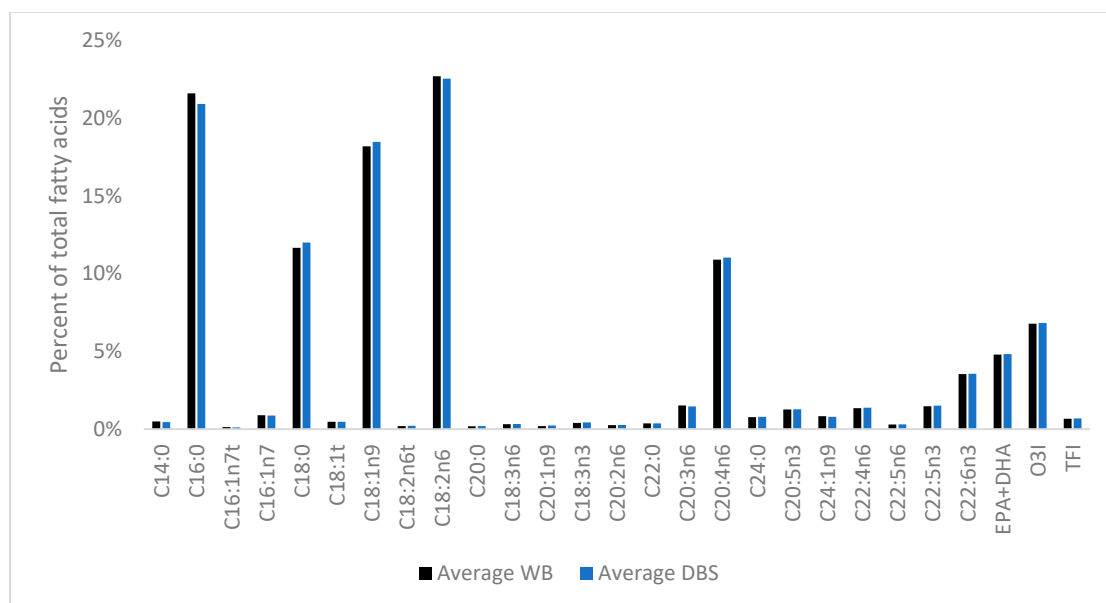


Figure S3. PCA of fatty acid signatures in blubber, plasma, and RBCs of 9 wild belugas (blue) and 14 oceanaria-based belugas from different locations, SeaWorld California (SWC-Blue), SeaWorld Florida (SWF-Red), SeaWorld Texas (SWT-Green) and wild beluga, BBB (Purple). Ellipses show 95% confidence intervals (CIs) around each sample type. Blubber samples of wild and oceanaria-based beluga show more similar fatty acid profiles with overlap of ellipses. PC1 and PC2 explain 65% of the variance.

