



Webb, E., Lewis, J., Shain, A., Kastrisianaki-Guyton, E., Honch, N., Stewart, A., ... Evershed, R. (2017). The influence of varying proportions of terrestrial and marine dietary protein on the stable carbon-isotope compositions of pig tissues from a controlled feeding experiment. *Science and Technology of Archaeological Research*, 3(1), 36-52. DOI: 10.1080/20548923.2016.1275477

Link to published version (if available):
[10.1080/20548923.2016.1275477](https://doi.org/10.1080/20548923.2016.1275477)

[Link to publication record in Explore Bristol Research](#)
PDF-document

University of Bristol - Explore Bristol Research

General rights

This document is made available in accordance with publisher policies. Please cite only the published version using the reference above. Full terms of use are available:
<http://www.bristol.ac.uk/pure/about/ebr-terms.html>

Supplementary Tables

Table 1: Carbon-isotope compositions of feeds

	Diet 1 ¹	Diet 2 ¹	Diet 3 ¹	Diet 4 ¹	Diet 5 ¹
Lot 1	-24.9	-24.5	-25.0	-24.7	-24.7
Lot 2	-25.1	-24.8	-24.6	-25.0	-24.2
Lot 3	-25.1	-24.5	-24.7	-24.9	-24.2
Lot 4	-24.8	-24.8	-25.1	-24.5	-24.7
<i>Average</i>	-25.0	-24.7	-24.9	-24.8	-24.5
<i>Standard Deviation</i>	0.2	0.2	0.2	0.2	0.3

¹ All values are reported in per mil (‰) relative to VPDB.

Table 2: Carbon-isotope compositions of sow tissues and fluids

Pig ID	Diet Group	Femoral Collagen ¹	Rib Collagen ¹	Femoral Muscle ¹	Loin Muscle ¹	Liver ¹	Milk ¹
F18	1	-21.8	-22.4	-23.7	-23.7	-24.2	-23.3
F17	1	-21.7	-21.9	-23.6	-23.6	-24.4	-23.7

F14	2	-21.1	-21.6	-23.0	-23.1	-23.5	
F13	2	-20.9	-21.0	-23.2	-23.0	-23.8	-22.8
F10	3	-20.7	-21.5	-22.7	-22.8	-23.6	-23.6
F12	3	-20.6	-21.5	-23.0	-22.8	-23.7	-22.9
F6	4						-22.6
F5	4	-19.6	-20.9	-21.9	-22.1	-23.0	-22.1
F8	4	-20.0	-20.3	-22.1	-22.0	-23.2	-22.8
F2	5	-17.9	-18.0	-19.9	-19.8	-21.7	-20.8
F3	5	-17.6	-18.5	-19.8	-19.9	-21.0	-20.9

¹ All values are reported in per mil (‰) relative to VPDB.

Table 3: Carbon-isotope compositions of piglet tissues

Pig ID	Diet Group	Femoral Collagen ¹	Rib Collagen ¹	Femoral Muscle ¹	Loin Muscle ¹	Liver ¹	Hair ¹
W15	1	-20.5					
W1839	1	-20.4	-20.7	-23.5	-23.3	-23.9	-21.5

W1846	1	-21.0	-21.8	-23.3		-23.9	-21.5
W1853	1	-21.1	-22.1	-23.4		-23.7	
W1766	2	-19.6	-19.9	-23.1	-22.9	-23.5	-21.2
W1767	2	-20.3	-20.6	-23.1		-23.5	-21.0
W1800	2	-20.6	-21.5	-23.0		-23.3	
W1822	2	-20.5	-21.3	-23.0		-23.8	
W1804	3	-20.3	-21.0	-22.7		-23.6	
W34	3	-19.9	-19.9	-22.7	-22.6	-23.0	-20.8
W43	3	-19.7	-19.9	-22.9	-22.8	-23.4	-20.9
W49	3	-20.0	-20.6	-22.7		-23.4	
W1789	4	-19.6	-20.1	-22.1		-22.7	
W1793	4	-18.9	-18.9	-21.9	-21.9	-22.1	
W21	4	-18.8	-18.9	-21.9	-21.7	-22.5	-19.9
W28	4	-19.3	-19.0	-22.1	-21.9	-22.6	-20.1
W1834	5	-16.8	-17.1	-20.1	-20.0	-20.6	-18.3
W1835	5	-17.5	-18.3	-20.0		-21.1	-18.4
W51	5	-17.6	-18.0	-19.9		-21.2	

¹ All values are reported in per mil (‰) relative to VPDB.

Table 4: Carbon-isotope compositions of pig tissues, fluids and excreta

Pig ID	Diet Group	Femoral Collagen ¹	Rib Collagen ¹	Femoral Muscle ¹	Loin Muscle ¹	Liver ¹	Blood ¹	Plasma I	Plasma II	Faeces
223	1						-25.1			
226	1	-21.3	-21.7	-23.7	-23.8	-25.1	-25.1	-24.4	-24.5	-25.5
227	1	-21.4	-21.8	-24.0	-24.0	-25.0	-25.2	-24.2	-24.5	
231	1	-21.4	-21.5	-23.9	-23.8	-24.6		-24.4		-25.8
232	1	-21.6	-21.8	-23.8	-23.8	-24.8		-24.2	-24.5	-25.9
266	2	-20.7	-21.1	-23.3	-23.4	-24.2	-24.5	-24.1	-23.9	
267	2	-20.9	-21.0	-23.5	-23.5	-24.4	-24.6	-24.1	-24.0	
268	2	-20.9	-21.3	-23.6	-23.4	-24.5	-24.5			-25.2
271	2	-21.2	-21.8	-23.5	-23.4	-24.3		-24.0	-24.0	
272	2						-24.6			
2-mix	2									-25.4
243	3	-20.6	-20.6	-23.0	-23.2	-23.7				-25.3
244	3	-20.6	-20.6	-23.1	-23.0	-24.0				-26.3
245	3						-24.5			
247	3	-20.4	-20.6	-23.1	-23.1	-23.9	-24.2	-23.6	-23.7	

248	3	-20.8	-20.9	-24.1	-23.0	-24.5	-24.4	-23.4	-23.9	-25.0
251	3						-24.3	-23.7	-23.8	
233	4	-19.4	-19.8	-22.0	-21.9	-23.4	-23.2	-22.9	-22.7	
237	4						-23.3			-24.7
238	4	-19.5	-19.3	-21.9	-21.9	-23.4		-22.8		-24.7
239	4	-19.6	-19.7	-22.2	-22.2	-23.7		-22.6		
240	4						-23.3			
241	4	-19.7	-19.7	-22.2	-22.2	-23.4	-21.4			-25.4
255	5	-17.7	-17.7	-20.1	-19.9	-21.3	-21.2	-21.2	-20.8	-24.0
256	5	-17.9	-18.1	-20.1	-20.1	-22.0	-21.3	-21.2	-21.2	
258	5	-17.1	-17.2	-20.4	-19.8	-21.7	-21.2	-21.3		-24.3
260	5	-17.3	-17.1	-19.9	-19.9	-21.2		-21.5		-24.2
262	5							-21.1	-21.3	
5-mix	5									-25.0

¹ All values are reported in per mil (‰) relative to VPDB.

Table 5: Tissue–whole diet and tissue–dietary protein isotopic offsets

	Sows		Piglets		Pigs	
	Average $\delta^{13}\text{C} \pm 1\sigma$ [range]		Average $\delta^{13}\text{C} \pm 1\sigma$ [range]		Average $\delta^{13}\text{C} \pm 1\sigma$ [range]	
	(‰, VPDB)		(‰, VPDB)		(‰, VPDB)	
	$\delta^{13}\text{C}_{\text{tissue}} - \delta^{13}\text{C}_{\text{whole diet}}$	$\delta^{13}\text{C}_{\text{tissue}} - \delta^{13}\text{C}_{\text{dietary}}$	$\delta^{13}\text{C}_{\text{tissue}} - \delta^{13}\text{C}_{\text{whole diet}}$	$\delta^{13}\text{C}_{\text{tissue}} - \delta^{13}\text{C}_{\text{dietary}}$	$\delta^{13}\text{C}_{\text{tissue}} - \delta^{13}\text{C}_{\text{whole diet}}$	$\delta^{13}\text{C}_{\text{tissue}} - \delta^{13}\text{C}_{\text{dietary}}$
		protein		protein		protein
Femoral Collagen						
<i>Diet 1</i>	+3.3±0.0 [0.1]	+3.9±0.0 [0.0]	+4.3±0.4 [0.7]	+4.9±0.4 [0.7]	+3.6±0.1 [0.3]	+4.2±0.1 [0.3]
<i>Diet 2</i>	+3.7±0.2 [0.2]	+4.0±0.2 [0.2]	+4.4±0.4 [1.0]	+4.7±0.4 [1.0]	+3.8±0.2 [0.5]	+4.1±0.2 [0.5]
<i>Diet 3</i>	+4.2±0.1 [0.1]	+3.7±0.1 [0.1]	+4.8±0.2 [0.5]	+4.3±0.2 [0.5]	+4.2±0.2 [0.4]	+3.7±0.2 [0.4]
<i>Diet 4</i>	+5.0±0.2 [0.3]	+3.3±0.2 [0.3]	+5.6±0.4 [0.8]	+3.9±0.4 [0.8]	+5.3±0.1 [0.3]	+3.6±0.1 [0.3]
<i>Diet 5</i>	+6.8±0.2 [0.2]	+2.8±0.2 [0.2]	+7.2±0.4 [0.8]	+3.2±0.4 [0.8]	+7.0±0.4 [0.8]	+3.0±0.4 [0.8]
<i>ρ value</i>	0.985	-0.901	0.892	-0.872	0.961	-0.920
<i>Significance</i>	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Rib Collagen						
<i>Diet 1</i>	+2.8±0.4 [0.5]	+3.4±0.4 [0.5]	+3.5±0.7 [1.4]	+4.1±0.7 [1.4]	+3.3±0.1 [0.3]	+3.9±0.1 [0.3]
<i>Diet 2</i>	+3.4±0.4 [0.6]	+3.7±0.4 [0.6]	+3.9±0.7 [1.6]	+4.2±0.7 [1.6]	+3.4±0.4 [0.8]	+3.7±0.4 [0.8]

<i>Diet 3</i>	+3.3±0.0 [0.0]	+2.8±0.0 [0.0]	+4.4±0.6 [1.2]	+3.9±0.6 [1.2]	+4.1±0.1 [0.3]	+3.6±0.1 [0.3]
<i>Diet 4</i>	+4.2±0.4 [0.6]	+2.5±0.4 [0.6]	+5.6±0.6 [1.3]	+3.9±0.6 [1.3]	+5.2±0.2 [0.5]	+3.5±0.2 [0.5]
<i>Diet 5</i>	+6.3±0.4 [0.5]	+2.3±0.4 [0.5]	+6.7±0.6 [1.1]	+2.7±0.6 [1.1]	+7.0±0.5 [1.0]	+3.0±0.5 [1.0]
<i>ρ value</i>	0.929	-0.944	0.865	-0.480	0.953	-0.765
<i>Significance</i>	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01

Femoral Muscle

<i>Diet 1</i>	+1.4±0.1 [0.1]	+2.0±0.1 [0.1]	+1.6±0.1 [0.2]	+2.2±0.1 [0.2]	+1.2±0.1 [0.3]	+1.8±0.1 [0.3]
<i>Diet 2</i>	+1.6±0.2 [0.2]	+1.9±0.2 [0.2]	+1.7±0.0 [0.1]	+2.0±0.0 [0.1]	+1.2±0.1 [0.3]	+1.5±0.1 [0.3]
<i>Diet 3</i>	+1.9±0.1 [0.2]	+1.4±0.1 [0.2]	+2.1±0.1 [0.3]	+1.6±0.1 [0.3]	+1.5±0.5 [1.1]	+1.0±0.5 [1.1]
<i>Diet 4</i>	+2.8±0.1 [0.2]	+1.1±0.1 [0.2]	+2.8±0.1 [0.2]	+1.1±0.1 [0.2]	+2.7±0.2 [0.3]	+1.0±0.2 [0.3]
<i>Diet 5</i>	+4.7±0.1 [0.2]	+0.7±0.1 [0.2]	+4.5±0.1 [0.2]	+0.5±0.1 [0.2]	+4.4±0.2 [0.5]	+0.4±0.2 [0.5]
<i>ρ value</i>	0.985	-0.951	0.958	-0.984	0.876	-0.907
<i>Significance</i>	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Loin Muscle

<i>Diet 1</i>	+1.3±0.1 [0.1]	+1.9±0.1 [0.1]	+1.7	+2.3	+1.2±0.1 [0.2]	+1.8±0.1 [0.2]
<i>Diet 2</i>	+1.6±0.1 [0.1]	+1.9±0.1 [0.1]	+1.8	+2.1	+1.3±0.0 [0.1]	+1.6±0.0 [0.1]

<i>Diet 3</i>	+2.0±0.0 [0.0]	+1.5±0.0 [0.0]	+2.1±0.1 [0.1]	+1.6±0.1 [0.1]	+1.7±0.1 [0.1]	+1.2±0.1 [0.1]
<i>Diet 4</i>	+2.8±0.1 [0.1]	+1.1±0.1 [0.1]	+3.0±0.1 [0.2]	+1.3±0.1 [0.2]	+2.7±0.2 [0.3]	+1.0±0.2 [0.3]
<i>Diet 5</i>	+4.6±0.0 [0.1]	+0.6±0.0 [0.1]	+4.5	+0.5	+4.6±0.1 [0.3]	+0.6±0.1 [0.3]
<i>ρ value</i>	0.988	-0.944	0.976	-0.976	0.979	-0.977
<i>Significance</i>	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Liver

<i>Diet 1</i>	+0.7±0.1 [0.2]	+1.3±0.1 [0.2]	+1.2±0.1 [0.2]	+1.8±0.1 [0.2]	+0.1±0.2 [0.5]	+0.7±0.2 [0.5]
<i>Diet 2</i>	+1.0±0.2 [0.3]	+1.3±0.2 [0.3]	+1.2±0.2 [0.4]	+1.5±0.2 [0.4]	+0.4±0.1 [0.3]	+0.7±0.1 [0.3]
<i>Diet 3</i>	+1.2±0.1 [0.1]	+0.7±0.1 [0.1]	+1.5±0.3 [0.6]	+1.0±0.3 [0.6]	+0.8±0.3 [0.7]	+0.3±0.3 [0.7]
<i>Diet 4</i>	+1.7±0.2 [0.2]	+0.0±0.2 [0.2]	+2.3±0.2 [0.6]	+0.6±0.2 [0.6]	+1.3±0.1 [0.3]	-0.4±0.1 [0.3]
<i>Diet 5</i>	+3.2±0.5 [0.7]	-0.8±0.5 [0.7]	+3.5±0.3 [0.6]	-0.5±0.3 [0.6]	+2.9±0.4 [0.8]	-1.1±0.4 [0.8]
<i>ρ value</i>	0.951	-0.926	0.907	-0.942	0.935	-0.917
<i>Significance</i>	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Blood

<i>Diet 1</i>					-0.1±0.1 [0.1]	+0.5±0.1 [0.1]
<i>Diet 2</i>					+0.1±0.1 [0.2]	+0.4±0.1 [0.2]

<i>Diet 3</i>	+0.5±0.1 [0.3]	+0.0±0.1 [0.3]
<i>Diet 4</i>	+1.6±0.1 [0.2]	-0.1±0.1 [0.2]
<i>Diet 5</i>	+3.2±0.1 [0.3]	-0.8±0.1 [0.3]
<i>ρ value</i>	0.984	-0.924
<i>Significance</i>	<0.01	<0.01

Plasma I

<i>Diet 1</i>	+0.7±0.2 [0.2]	+1.3±0.2 [0.2]
<i>Diet 2</i>	+0.6±0.1 [0.1]	+0.9±0.1 [0.1]
<i>Diet 3</i>	+1.1±0.7 [0.7]	+0.8±0.3 [0.3]
<i>Diet 4</i>	+2.0±0.2 [0.2]	+0.3±0.4 [0.4]
<i>Diet 5</i>	+3.2±0.4 [0.4]	-0.8±0.4 [0.4]
<i>ρ value</i>	0.925	-0.975
<i>Significance</i>	<0.01	<0.01

Plasma II

<i>Diet 1</i>	+0.5±0.0 [0.1]	+1.1±0.0 [0.1]
<i>Diet 2</i>	+0.7±0.0 [0.1]	+1.0±0.0 [0.1]

<i>Diet 3</i>			+1.0±0.1[0.2]	+0.5±0.1 [0.6]
<i>Diet 4</i>			+2.1	+0.4
<i>Diet 5</i>			+3.4±0.3 [0.5]	-0.6±0.3 [0.5]
<i>ρ value</i>			0.985	-0.963
<i>Significance</i>			<0.01	<0.01

Faeces

<i>Diet 1</i>			-0.7±0.2 [0.4]	-0.1±0.2 [0.4]
<i>Diet 2</i>			-0.6±0.2 [0.3]	-0.3±0.2 [0.3]
<i>Diet 3</i>			-0.9±0.5 [1.0]	-1.4±0.5 [1.0]
<i>Diet 4</i>			-0.1±0.2 [0.3]	-1.8±0.2 [0.3]
<i>Diet 5</i>			+0.2±0.3 [0.6]	-3.8±0.3 [0.6]
<i>ρ value</i>			0.832	-0.934
<i>Significance</i>			<0.01	<0.01

Milk

<i>Diet 1</i>	+1.5±0.3 [0.4]	+2.1±0.3 [0.4]
<i>Diet 2</i>	+1.9	+2.2

<i>Diet 3</i>	+1.5±0.4 [0.6]	+1.0±0.4 [0.6]
<i>Diet 4</i>	+2.3±0.3 [0.7]	+0.6±0.3 [0.7]
<i>Diet 5</i>	+3.7±0.0 [0.0]	-0.3±0.0 [0.0]
<i>ρ value</i>	0.879	-0.929
<i>Significance</i>	<0.01	<0.01

Hair

<i>Diet 1</i>	+3.5±0.1 [0.1]	+4.1±0.1 [0.1]
<i>Diet 2</i>	+3.6±0.1 [0.1]	+3.9±0.1 [0.1]
<i>Diet 3</i>	+4.0±0.0 [0.1]	+3.5±0.0 [0.1]
<i>Diet 4</i>	+4.8±0.1 [0.2]	+3.1±0.1 [0.2]
<i>Diet 5</i>	+6.2±0.0 [0.0]	+2.2±0.0 [0.0]
<i>ρ value</i>	0.972	-0.988
<i>Significance</i>	<0.01	<0.01

Table 6. Preliminary single amino acid $\delta^{13}\text{C}$ results for diet, sow collagen and sow muscle and $\Delta^{13}\text{C}_{\text{tissue-diet}}$

Diet	100% Marine Diet		50% Marine Diet		25% Marine Diet		12.5% Marine Diet		0% Marine Diet						
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD					
Amino Acid															
ASP	-14.16	0.82	-16.75	0.20	-19.99	0.34	-22.91	0.47	-21.06	0.88					
GLU	-15.69	0.75	-21.93	0.19	-24.49	0.34	-24.64	0.37	-24.93	0.38					
GLY	-8.61	0.31	-13.26	0.56	-15.97	0.97	-17.14	0.10	-19.08	0.14					
ALA	-17.65	0.25	-19.87	0.80	-21.23	0.68	-20.09	0.39	-21.80	0.45					
PRO	-17.78	0.36	-22.31	0.73	-24.25	0.82	-25.30	0.34	-25.97	0.18					
TYR	-25.21	0.69	-25.92	0.14	-26.78	0.62	-26.56	0.11	-27.19	0.01					
ARG	-19.84	0.93	-23.88	0.26	-24.73	0.61	-25.72	0.13	-26.19	0.39					
THR	-12.46	0.48	-16.88	1.71	-18.74	0.49	-17.81	0.22	-19.54	0.71					
VAL	-24.40	0.16	-28.07	0.36	-30.37	1.56	-30.09	0.59	-31.81	0.13					
LEU/ILE	-24.75	0.11	-27.61	0.05	-29.76	0.97	-29.86	0.01	-30.39	0.26					
LYS	-17.48	-	-19.16	-	-19.78	0.30	-20.39	0.64	-20.27	0.71					
PHE	-26.35	0.23	-27.97	0.31	-28.52	0.39	-28.48	0.11	-28.89	0.18					
Collagen	$\delta^{13}\text{C}_A$	$\Delta^{13}\text{C}_{\text{Col-diet}}$	$\delta^{13}\text{C}_A$	$\Delta^{13}\text{C}_{\text{Col-diet}}$	$\delta^{13}\text{C}_A$	$\Delta^{13}\text{C}_{\text{Col-diet}}$	$\delta^{13}\text{C}_A$	$\Delta^{13}\text{C}_{\text{Col-diet}}$	$\delta^{13}\text{C}_A$	$\Delta^{13}\text{C}_{\text{Col-diet}}$					
Amino Acid	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD					
ASP	-19.04	0.32	-4.88	-20.15	0.19	-3.40	-20.51	0.02	-0.52	-20.63	0.01	2.28	-21.01	0.04	0.05
GLU	-17.82	0.15	-2.13	-18.57	0.03	3.37	-18.79	0.22	5.70	-18.67	0.06	5.98	-19.27	0.31	5.67
GLY	-9.91	0.54	-1.30	-12.59	0.95	0.67	-13.70	0.51	2.27	-14.28	0.34	2.86	-15.81	0.26	3.28
ALA	-20.77	0.12	-3.12	-20.69	0.36	-0.82	-20.88	0.31	0.36	-20.86	0.54	-0.77	-21.54	0.21	0.27
PRO	-17.60	0.29	0.18	-20.43	0.18	1.88	-21.17	0.16	3.09	-21.27	0.72	4.03	-22.59	0.24	3.39
TYR	-25.77	0.52	-0.56	-27.41	0.67	-1.49	-28.22	0.05	-1.44	-27.99	0.11	-1.43	-28.38	0.03	-1.19
ARG	-19.40	0.64	0.44	-22.85	0.91	1.03	-23.80	0.27	0.93	-23.85	0.14	1.88	-24.83	0.36	1.37
THR	-14.48	0.39	-2.02	-18.55	0.70	-1.67	-20.25	0.51	-1.51	-20.36	0.23	-2.55	-20.82	0.72	-1.28
VAL	-26.06	0.48	-1.66	-29.39	0.50	-1.32	-29.31	1.56	1.06	-29.52	0.99	0.57	-31.34	0.27	0.47

LEU/ILE	-25.53	0.27	-0.78	-28.39	0.35	-0.77	-29.12	0.06	0.65	-29.62	0.12	0.24	-29.92	0.22	0.48
LYS	-16.81	0.21	0.67	-18.47	0.08	0.69	-19.08	0.14	0.71	-19.78	0.23	0.61	-20.29	0.19	-0.02
PHE	-26.02	0.18	0.34	-27.56	0.33	0.41	-27.98	0.22	0.54	-28.08	0.07	0.41	-28.29	0.28	0.61
Muscle	$\delta^{13}\text{C}_A$		$\Delta^{13}\text{C}_{\text{Mus-diet}}$	$\delta^{13}\text{C}_A$		$\Delta^{13}\text{C}_{\text{Mus-diet}}$	$\delta^{13}\text{C}_A$		$\Delta^{13}\text{C}_{\text{Mus-diet}}$	$\delta^{13}\text{C}_A$		$\Delta^{13}\text{C}_{\text{Mus-diet}}$	$\delta^{13}\text{C}_A$		$\Delta^{13}\text{C}_{\text{Mus-diet}}$
	A		diet	A		diet	A		diet	A		diet	A		diet
Amino Acid	Mean	SD		Mean	SD		Mean	SD		Mean	SD		Mean	SD	
ASP	-17.31	0.12	-3.15	-18.61	0.47	-1.86	-20.24	0.35	-0.25	-18.95	-	3.96	-19.55	1.73	1.51
GLU	-16.35	0.61	-0.66	-17.59	0.29	4.34	-17.17	0.39	7.33	-17.97	1.08	6.68	-17.61	0.48	7.32
GLY	-11.14	0.65	-2.53	-14.28	0.43	-1.02	-15.71	0.24	0.26	-16.47	0.60	0.67	-16.87	0.53	2.22
ALA	-19.91	0.31	-2.26	-19.60	0.62	0.28	-20.60	0.58	0.64	-20.90	0.35	-0.81	-20.24	0.78	1.56
PRO	-17.68	0.09	0.11	-20.38	0.38	1.94	-21.69	0.56	2.56	-22.55	0.21	2.75	-23.69	0.82	2.28
TYR	-25.20	0.13	0.02	-26.94	0.05	-1.02	-27.59	0.07	-0.81	-27.68	0.10	-1.12	-28.33	0.18	-1.14
ARG	-20.09	-	-0.25	-	-	-	-23.86	-	0.87	-24.81	0.05	0.91	-25.39	0.36	0.81
THR	-11.97	0.33	0.50	-15.77	0.69	1.11	-17.17	0.18	1.57	-17.71	1.07	0.11	-19.02	1.22	0.52
VAL	-24.62	0.08	-0.22	-27.61	0.47	0.46	-29.22	0.40	1.16	-29.65	0.39	0.44	-30.72	0.19	1.09
LEU/ILE	-24.18	0.20	0.57	-27.06	0.26	0.56	-28.33	0.12	1.44	-28.71	0.16	1.16	-29.53	0.25	0.86
LYS	-17.54	0.27	-0.06	-19.06	0.13	0.11	-19.95	0.10	-0.17	-20.54	0.18	-0.15	-20.91	0.34	-0.64
PHE	-26.03	0.10	0.33	-27.57	0.21	0.40	-28.22	0.20	0.30	-28.44	0.21	0.04	-28.69	0.15	0.21