

Table S1: Body composition, exercise training, energy intake and macronutrient intake measured in the seven days prior to each time point.

Participant	Timepoint	Lean mass (kg)	Fat mass (kg)	Resistance training (kg/week)	Aerobic training (minutes/week)	Energy (kJ/kg)	Protein (g/kg)	Fat (g/kg)	Carbohydrate (g/kg)
P1	PRE8	73.5	5.39	87832	27	129	3.29	1.08	1.71
	PRE1	71.7	5.04	34346	0	184	4.42	1.38	3.19
	POST4	74.1	6.98	44884	0	150	3.07	1.04	3.28
P2	PRE8	55.3	11.51	42010	80	84	2.03	0.40	1.79
	PRE1	55.1	10.21	48369	150	90	2.39	0.28	1.91
	POST4	56.2	14.31	23341	0	128	0.91	0.77	4.62
P3	PRE8	74.3	7.74	51297	124	179	2.74	1.41	4.44
	PRE1	73.9	4.44	38950	16	132	2.55	1.00	2.61
	POST4	75.9	7.45	29545	0	263	3.17	2.22	7.27
P4	PRE8	70.4	6.68	68370	112	137	2.63	0.69	3.55
	PRE1	69.0	4.40	32970	40	118	2.14	0.59	3.26
	POST4	71.5	6.47	100441	20	149	2.72	0.93	3.79
P5	PRE8	63.3	3.64	89818	200	119	2.64	0.97	2.09
	PRE1	61.6	2.76	68168	190	105	1.92	0.61	2.83
	POST4	64.8	3.87	60792	0	157	2.58	1.42	3.63

Table S3: Circulating metabolites significantly different ($p < 0.05$) by timepoint.

Super pathway	Pathway	Metabolite	KEGG	HMDB	Significant difference by timepoint (p-value)*	Mean fold change (post-competition / pre-competition)
Amino acid	Creatine metabolism	Guanidinoacetic acid	C00581	HMDB00128	0.003	0.3
	Glycine, serine, threonine metabolism	L-Homoserine	C00263	HMDB00719	0.024	1.2
		α -Ketobutyrate	C00109	HMDB00005	0.001	0.4
	Lysine metabolism	Saccharopine	-	HMDB00279	0.004	1.3
Cofactor	Nicotinate and nicotinamide metabolism	NAD ⁺	C00003	HMDB00902	0.001	1.2
Lipid	Fatty acid metabolism	Acetylcarnitine	C02571	HMDB00201	0.007	0.8
	Fatty acid synthesis	Malonate	C00383	HMDB00691	0.003	0.2
	Ketone body	β -Hydroxybutyrate	C01089	HMDB00357	0.003	0.2
	Phospholipid metabolism	Choline	C00114	HMDB00925	0.035	1.2

*Kruskal-Wallis test