Author	Classification	Subjects	Nutrient	Exercise/Condition	Results	Comment	Endpoint
Macronutrients							
Bennet 1989	Macronutrient	7 M	Mixed AA	–	↑ MPS	AA alone maximally stimulate MPS	Metabolism
Smith 1998	Macronutrient	23 M	EAA NEAA	–	↑ MPS ←→	EAA driver of increased MPS	Metabolism
Casperson 2012	Macronutrient	8 M	12g/d LEU 13d	–	↑ MPS ↑ mTOR signalling	LEU increases MPS	Metabolism
Wall 2013	Macronutrient	24 M	n=12: 20g PRO n=12: 20g PRO + 2.5g LEU	–	> ↑ MPS following PRO+LEU vs. PRO	LEU co-ingestion with PRO potentiates MPS	Metabolism
Leucine Metabolites							
Nissen 1996	Nutraceutical	28 M	n=15: 3g/d HMB n=13: PLA 7wks	RET 6*wk 7wks	HMB ↑ LBM > placebo HMB ↑ strength	HMB plus RET potentiates gains in LBM	Mass Performance

Wilkinson 2013	Nutraceutical	15 M	n=8: 3.42g HMB (2.42g pure HMB) n=7: 3.42 g LEU	–	HMB & LEU ↑ MPS, HMB ↑ mTOR signalling > LEU, HMB ↓ MPB	HMB promotes ↑ MPS and ↓ MPB	Metabolism
Deutz 2013	Nutraceutical	4 M 15 F	n=11: 3g/d HMB n=8: PLA	10d bed rest	HMB ←→ LBM PLA ↓ LBM	HMB preserves muscle mass during disuse	Mass
Baier 2009	Nutraceutical	38 M 39 F	n=40: 2 or 3g HMB, 1.5 or 2.25g lysine, 5 or 7.5 g arginine & 0.1g ascorbic acid n=37: PLA 1yr	-	↑ FFM	AA cocktail enhanced muscle mass	Mass
Panton 2000	Nutraceutical	39 M 36 F	n=36: HMB (3g/d) n=39: PLA	RET 3*wk 4 wks	↑ strength > PLA	HMB improved muscle function	Performance
Wilson 2014	Nutraceutical	20 M	n=11: HMB (3g/d) n=9: PLA	Periodised RET 12 wks	↑ strength, power and LBM vs. PLA	HMB enhances muscle function & hypertrophy	Mass Performance

Vukovich 2001	Nutraceutical	8 M	n=8: 3g/d HMB n=8: 3g/d LEU n=8: 3g/d PLA 2wks	-	HMB ↑ time to reach VO_{2peak} HMB & LEU ↑ OBLA	HMB improves aerobic performance	Performance
Miramonti 2016	Nutraceutical	22 M 15 F	n=14: 3g/d HMB n=14: 3g/d PLA n=9: CON 4 wks	HIIT 3*wk 4 wks	↑ PWC_{FT} following HMB > PLA & CON	HMB & HIIT improves aerobic performance	Performance
Knitter 2000	Nutraceutical	5 M 8 F	n=8: 3g/d HMB n=5: PLA 6 wks	Running >30 km/wk	Attenuated ↑ in CPK & LDH post 20 km run following HMB	HMB ameliorates aspects of muscle damage	Performance
				Creatine			
Greenhaff 1993	Nutraceutical	9 M 3 F	n=6: 20g/d CR + 1g/d glucose/ n=6: 24g/d glucose 5d	5 x 30 max voluntary contractions, before and after supplementation	CR ↓ peak torque decline	CR sustains performance	Performance
Birch 1994	Nutraceutical	14 M	n=7: CR 20g/d n=7: PLA 5d	3 x 30 sec max cycling sprints	CR ↑ PPO, MPO and total work output during 1st sprint	CR increases aspects of power output	Performance

Earnest 1995	Nutraceutical	8 M	n=4: 5g/d CR n=4: PLA 2-4 wks	3 x 30 sec max cycling 1-RM test 70% of 1-RM until fatigue	CR ↑ total anaerobic work during cycling sprints, ↑ BW, ↑ total lifting volume	CR enhances muscle function	Mass & Performance
Cooke 1995	Nutraceutical	12 M	n=6: 5g CR + 1g glucose n=6: PLA 5d	Max cycling sprint	←→ in power indices	CR does not affect power output	Performance
Mujika 1996	Nutraceutical	11 M 9 F	n=10: 20g/d CR n=10: PLA 1 wk	20, 50 & 100 m max swim	No difference in race time between groups	CR has no ergogenic benefits on sprint performance	Performance
Snow 1998	Nutraceutical	8 M	n=4: 30g/d CR + 30g/d dextrose n=4: PLA 5d	20 sec max cycling	CR did not affect power indices	CR has no ergogenic benefits on sprint performance	Performance
Thompson 1996	Nutraceutical	10 F	n=5: 2g/d CR n=5: PLA 6 wks	6 wks swimming (part of a swim team)	←→ in lean mass, resynthesis of PCr or performance time	CR has no effect on body composition, anaerobic or aerobic performance	Mass & Performance
Cooke 2009	Nutraceutical	14 M	n=7: 0.1-0.3g/kg/d CR + CHO n=7: CHO 19d	4 sets, 10 ECC reps @ 120% of CONC 1-RM for 3 leg exercises	CR+CHO ↑ isokinetic & isometric strength during recovery vs. CHO	CR improves functional recovery	Performance

Volek 1999	Nutraceutical	19 M	n=10: 25 g/d 1 wk, 5 g/d 11 wks CR n=9: PLA	RET 12 wks	> ↑ in strength, CSA, following CR vs. PLA	CR potentiates RET-induced muscle adaptations	Mass & Performance
Brose 2003	Nutraceutical	15 M 13 F	n=14: 5g/d CR + 2g dextrose n=14: pla	RET 3*wk, 14 wks	> ↑ in FFM and strength following CR vs. PLA	CR potentiates RET-induced mass and functional adaptations	Mass & Performance
Carnitine							
Stephens 2006	Nutraceutical	7 M	n=7: 5h CAR infusion (15 mg/kg prime, 10 mg/kg·h constant) n=7: PLA	-	CAR ↑ muscle glycogen, LCA-CoA & ↓ PDH complex activity, lactate vs. PLA	CAR can inhibit CHO oxidation	Fuel Metabolism
Wall 2011	Nutraceutical	14 M	n=7: 2 g CAR + 80 g CHO n=7: 80 g CHO 2*d, 24 wks	30 mins cycling @ 50% VO_{2max}, 30 mins at 80% VO_{2max}, 30 min all-out	@ 50% VO_{2max} carnitine ↓ glycogen use	CAR spares muscle glycogen	Metabolism & Performance
Stephens 2013	Nutraceutical	12 M	n=6: 1.36 CAR + 80g CHO n=6: 80g CHO 2*d, 12 wks	30 min cycling @ 50% VO_{2max}	CAR ↑ LCA-CoA ↑ fat mass in CHO	CAR prevented fat mass gain	Metabolism

Abramowicz 2005	Nutraceutical	6 M 6 F	n=12: 1*3g CAR + TART n=12: 3g/d CAR + TART, 14d n=12: PLA, 14d	60 min cycling @ 60% VO_{2max}	CAR + TART for 14d ↑ CHO oxidation in M vs. PLA No effect on FO	CAR & TART promote CHO oxidation during exercise	Metabolism
Broad 2005	Nutraceutical	15 M	n=15: 3g/d CAR + TART n=15: PLA 4 wks	90 min cycling @ 65% VO_{2max}, 20 km TT	FO and CHO similar between CAR & TART vs. PLA during exercise TT duration ↓ in PLA only	CAR & TART enhance energy metabolism or endurance performance	Energy Metabolism & Performance
				n-3 PUFAs			
Smith 2011	Nutraceutical	5 M 4 F	4g/d n-3 PUFAs 8 wks	–	↑ MPS & ↑ mTOR signalling during hyperinsulinaemia-hyperaminoacidaemia	n-3 PUFAs augments acute anabolic responses	Metabolism
Smith 2011	Nutraceutical	15 M 29 F	n=29: 4 g/d n-3 PUFAs n=15: corn oil 6 months	–	n-3 PUFAs ↑ mass & ↑ strength vs. corn oil	n-3 PUFAs promotes muscle growth	Mass
Huffman 2004	Nutraceutical	7 M	n-3 PUFAs 4 g/d 3 wks	60 mins running @ 60% VO_{2max}	↑ fat EE	Chronic n-3 PUFAs promote fat oxidation during exercise	Metabolism

Logan 2015	Nutraceutical	24 F	n=12: 2g/d EPA + 1g/d DHA n=12: PLA 12 wks	Pre & post exercise testing	n-3 PUFAs ↑ LBM, ↑ rate of FO & ↓ TUG	n-3 PUFAs promotes fat metabolism, muscle mass and function	Mass, Fat Metabolism and Performance
Smith 2015	Nutraceutical	10 M 29 F	N=29: 1.86g/d EPA + 1.5 g/d DHA N=25: PLA 24 wks	-	n-3 PUFAs ↑ muscle volume & strength vs. PLA	n-3 PUFAs preserve muscle mass and function	Mass & Performance
Rodacki 2012	Nutraceutical	45 F	n=15: 400 g/d EPA + 300g/d DHA 90d + RET n=15: 400 g/d EPA + 300g/d DHA 150d + RET N=15: RET	RET 3*wk, 12 wks	> ↑ in peak torque following n3-PUFAs vs. RET	n3-PUFAs potentiate strength adaptations to RET	Strength Performance
McGlory 2016	Nutraceutical	19 M	n=10: 5g/d n3-PUFAs n=9: PLA 8 wks	Acute RE 3 sets, 10 reps @ 70% 1-RM	Rest and exercise MPS similar following n3-PUFAs vs. PLA ↑ p70S6K1 after RE in PLA only	n3-PUFAs does not potentiate RE-induced metabolic responses	Metabolism
Delarue 1996	Nutraceutical	4 M 1 F	n=5: 6g/d n-3 PUFAs n=5: PLA 3 wks	-	n-3 PUFAs ↑ FO & ↓ CHO oxidation	n-3 PUFAs manipulates energy metabolism	Energy Metabolism

Delarue 2003	Nutraceutical	6 M	n=6: 6g/d n-3 PUFAs n=6: PLA 20d	Acute 90 min cycling @ 60% max O_2 output	n-3 PUFAs tended to ↑ FO and ↓ CHO oxidation > PLA	n-3 PUFAs might manipulate energy metabolism during exercise	Energy metabolism
Nitrates/Blood flow							
Tang 2011	Nutraceutical	8 M	n=8: 10g EAA + 10g Arg n=8: PLA	Unilateral acute RE, 5 sets 8-10 reps	↑ in blood flow and MPS following RE similar in Arg vs. PLA	Arg has no additive effects on muscle blood flow or MPS	Protein Metabolism
Churchward-Venne 2014	Nutraceutical	21 M	n=7: 45g Whey n=7: 10g citrulline + 15g whey n=7: 10g NEAA + 15g whey	Acute RE: 6x8-10 reps @ 80% 10-RM knee extension	No ↑ in MPS, blood flow or perfusion following citrulline+whey vs. NEAA+whey	No additive effect of citrulline on metabolism	Protein Metabolism
Phillips 2016	Nutraceutical	20 M	n=10: 350 mg cocoa flavanol n=10: CON	-	↑ LBF and MBV following cocoa flavanol ←→ MPS following cocoa flavanol vs. CON	Cocoa flavanols improve vascular but not MPS responses to nutrition	Protein Metabolism
Lansley 2011	Nutraceutical	9 M	n=9: 500 ml BRJ n=9: 500 ml PLA	4 & 16.1 km cycling TT	↑ TT performance	Nitrates improve TT performance	Performance
Larsen 2007	Nutraceutical	9 M	n=9: 0.1mmol kg/d $NaNO_3$ n=9: PLA 3d	Sub-max and max cycling	$NaNO_3$ ↓V_{O2} at sub-max vs. PLA	$NaNO_3$ reduced O_2 cost during sub-max exercise	Performance

Bailey 2009	Nutraceutical	8 M	n=8: 500ml/d BRJ n=8: PLA 6d	Moderate & intense exercise	BRJ ↓V_{O2} during moderate exercise vs. PLA BRJ ↑ TTE during intense exercise	BRJ can reduce O_2 cost & improve exercise tolerance	Performance
Muggeridge 2014	Nutraceutical	9 M	n=9: 1*70ml BRJ n=9: PLA	15 min steady state, 5 min rest, 16.1 km TT	BRJ ↓V_{O2} during moderate exercise vs. PLA TT performance was faster following BRJ	BRJ enhances endurance performance	Performance
Wylie 2013	Nutraceutical	14 M	n=14: 490ml BRJ over 30h n=14: PLA	Yo-Yo IR1	BRJ ↑ Yo-Yo IR1 performance vs. PLA	BRJ improved high intensity running performance	Performance
Arnold 2015	Nutraceutical	10 M	n=10: 70 ml BRJ n=10: PLA	Incremental treadmill running + 10km TT	BRJ did not change TTE during incremental exercise or time to completion in the TT vs. PLA	BRJ does not enhance endurance running	Performance
Cermak 2012	Nutraceutical	20 M	n= 20: 1*140 ml BRJ n=20: PLA	1h cycling TT	TT performance & power output similar between BRJ vs. PLA	BRJ does not improve endurance performance	Performance
Wilkerson 2012	Nutraceutical	8 M	n=8: 1*500ml BRJ n=8: PLA	50 mile cycling TT	No difference between BRJ vs. PLA for completion time & power output Trend for BRJ ↓V_{O2}	BRJ did not improve TT performance	Performance
			β-alanine and Carnosine				
Kendrick 2008	Nutraceutical	26 M	n=13: 6.4g/d β-ala n=13: PLA 4 wks	RET 4*wk, 10 wks	Similar ↑ in strength & body mass	No additive effect of β-ala on strength, mass	Mass & Performance

Hill 2007	Nutraceutical	25 M	n=13: 4-6.4g/d β-ala n=12: PLA	-	4 & 10 wks of β-ala ↑ TWD during cycling	β-ala improves exercise capacity	Performance
Derave 2007	Nutraceutical	15 M	n=8: 4.8g/d β-ala n=7: PLA 4-5wks	Track & field ~5*wk	β-ala ↑ knee torque during repetitive exercise bouts	β-ala attenuates fatigue	Performance
Stout 2007	Nutraceutical	22 F	n=11: 3.2-6.4g/d β-ala n=11: PLA 4 wks	-	β-ala ↑ PWC_{FT}, VT & TTE	β-ala delays the onset of neuromuscular fatigue	Performance
				VitD			
Agergaard 2015	Micronutrient	17 M, Y 17 M, O	n=7 Y, 7 O: 1920 IU/d VitD + 800 mg/d calcium n=10 Y, 10 O: 800 mg/d calcium 16 wks	RET 3*wk @ 65-85% 1-RM, 12 wks	Fibre type IIa %age > ↑ & myostatin mRNA > ↓ in Y VitD vs. Y pla No difference in the ↑ of CSA and strength in VitD vs. calcium	But no additive effect on mass or strength	Mass and Performance
Carrilo 2013	Micronutrient	11 M 12 F	n=10: 4000 IU/d VitD n=13: PLA	RET 3*wk @ 70-80% 1-RM, 3 months	←→ LBM following VitD or PLA ↑ peak power following VitD	VitD has no impact on mass but can improve muscle power	Mass & Performance
Bunout 2006	Micronutrient	10 M 86 F	n=24: 800 mg/d calcium + 400 IU/d VitD n=24: 800 mg/d calcium n=24: 800 mg/d calcium	RET 2*wk, 9 months	> improvement in TUG in VitD + RET vs. RET	VitD enhances muscle function	Performance

			+ 400 IU/d VitD + RET n=24: 800 mg/d calcium & RET				
Ceglia 2013	Micronutrient	21 F	4000 IU/d VitD 4 months	–	↑ type I/II CSA	VitD increases muscle fibre size	Mass
				VitC and VitE			
Bobeuf 2010	Micronutrient	23 M, 25 F	n=11: AS (1000 mg/d VitC & 600 mg/d VitE) n=12: PLA n=13: RET n=12: AS+RET	RET 3*wk @ 80% 1-RM, 6 months	> ↑ FFM in AS+RET vs. PLA, RET or AS.	AS potentiates RET-induced gains in FFM	Mass
Bjørnsen 2015	Micronutrient	34 M	n=17: AS (1000 mg/d VitC + VitE 235 mg/d) n=17: PLA	RET 3*wk, 3 months	> ↑ in total LBM and muscle thickness in PLA vs. AS	AS blunt ↑ in total LBM	Mass
Paulsen 2014	Micronutrient	21 M 11 F	n=17: AS (1000 mg/d VitC + 235 mg/d VitE) n=15: PLA	RET 4*wk, 10 wks	> ↑ p38 MAPK, p70S6K, ↑ ERK1/2 in PLA vs. AS Similar changes in FSR, CSA & total LM	AS altered protein signalling but not muscle hypertrophy	Mass & Metabolism
Labontè 2008	Micronutrient	27 M 34 F	600 mg VitE + 1000 mg VitC 6 months	RET 3*wk, 6 months	> ↑ FFM compared to RET alone	AS potentiate FFM gains	Mass

Bobeuf 2011	Micronutrient	27 M 30 F	n=11: AS (1000 mg/d VitC + 600 mg/d VitE) n=12: PLA n=13: RET n=12: AS+RET	RET 3*wk @ 80% 1-RM, 6 months	Similar ↑ in FFM and strength in AS+RET vs. RET	AS do not maximize strength or mass gains	Mass & Performance
Paulsen 2014	Micronutrient	26 M 28 F	n=27: AS (1000 mg/d VitC + 600 mg/d VitE) n=27: PLA	EET 3-4*wk, 11 wks	Similar ↑ in VO_{2max} ←→ COX4 and PGC-1α	AS hampered mitochondrial cellular adaptations	Performance
Yfanti 2010	Micronutrient	21 M	n=11: AS (500 mg/d VitC + VitE 400 IU/d) n=10: PLA 16 wks	EET 5*wk, 12 wks	Similar ↑ in VO_{2max}, P_{max}, workload at LT, muscle glycogen, muscle enzyme activity	AS have no effect on adaptation to EET	Performance
Gomez-Cabrera 2008	Micronutrient	14 M	n=5: VitC 1g/d + EET n=9: EET	EET 3*wk 65-80% of VO_{2max}, 8 wks	Similar ↑ in VO_{2max}	VitC has no effect on adaptation to EET	Performance
				Ursolic Acid			
Bang 2014	Nutraceutical	16 M	n=9: 450 mg/d UA n=7: PLA	RET 6*wk @60-80% 1-RM, 8 weeks	> ↑ strength vs. PLA ←→ LBM in UA or PLA	UA promotes gains in strength but not LBM	Performance
				Phosphatidic Acid			
Joy 2014	Nutraceutical	28 M	n=14: 750 mg/d PA n=14: PLA	RET 3*wk, 8 wks	> ↑ LBM, CSA & strength vs. PLA	PA potentiates RET-induced mass and strength gains	Mass & Performance

Hoffman 2012	Nutraceutical	16 M	n=7: 750 mg PA n=9: PLA	RET 4*wk @ 70% 1-RM, 8 wks		NS. ↑ LBM & strength	PA did not potentiate RET-induced gains in mass or strength	Mass & Performance