

Supplemental Table 2 Characteristics of included studies for systematic review

Study (author, year)	<i>n</i>	Gender (M/F)	Training status ¹	Age (y) ²	Exercise session ³	Indices of zinc status (serum, RBC, urine, sweat)
Anderson 1984	9	M	Moderately trained	23-46	Running, maximal	Serum, urine
Anderson 1995	8	M	Moderately trained	40.4 ± 4.3	Running, maximal	Serum, urine
	5	M	Untrained	33 ± 2.1	Running, maximal	
Arslan 2009	11	M	Athletic	20.2 ± 1.23	Conditioning and technical exercise, 90 min	Serum
Aruoma 1988	12	M	Moderately trained	21	Cycling, 80% $\dot{V}O_2$ max, 30-40 min	Serum, sweat
Bolonchuk 1991	8	M	Athletic	NP ⁴	Running, maximal	Serum
Bordin 1993	9	M	Untrained	23 ± 3	Running, 80-90% $\dot{V}O_2$ max, 30 min	Serum
	10	F	Untrained	23 ± 1	Running, 80-90% $\dot{V}O_2$ max, 30 min	
Buchman 1998	26	M+F	Moderately trained	18-55	Running, marathon	Serum, urine
Cinar 2007	10	M	Athletic	18-22	Running, maximal	Serum
Cinar 2009	10	M	Athletic	17-21	Not specified	Serum
Cordova 1998	12	M	Athletic	25.9 ± 2.6	Cycling, maximal	Serum, sweat
	12	M	Moderately trained	22.3 ± 1.2	Cycling, maximal	
DeRuisseau 2002 ⁵	9	M	Moderately trained	27.7 ± 5.0	Cycling, 50% $\dot{V}O_2$ peak, 4 x 30 min	Sweat
	9	F	Moderately trained	24 ± 4.3	Cycling, 50% $\dot{V}O_2$ peak, 4 x 30 min	
Deuster 1991	38	F	Athletic	29.9 ± 0.8	Running, marathon	Serum, RBC
D'Inca 1999	6	M	Untrained	31.3 ± 4.9	Cycling, 60% $\dot{V}O_2$ max, 60 min	Serum
Doker 2014	10	M	Untrained	22 ± 2	Swimming, 400 m	Serum
	11	M	Moderately trained	25 ± 4	Swimming, 800 m	
	14	M	Athletic	23 ± 4	Swimming, 800 m	
Gleeson 1995	8	M+F	Untrained	28 ± 8	Step test, 40 mins	Serum
Gonzalez-Haro 2011	27	M	Athletic	33.8 ± 6.7	Cycling, maximal	Serum
Granel 2014	22	M	Moderately trained	20-35	Running, 60% $\dot{V}O_2$ max, 40 min	Serum, urine
Hazar 2009 ⁵	11	M	Athletic	20.1 ± 1.5	Rowing, 2000 m	Serum
Hoshi 2002 ⁵	10	M	Untrained	23.3 ± 1.3	Cycling, 60 min	Sweat

Iri 2007	10	M	Athletic	23.1 ± 2.46	Cycling, maximal	Serum
	10	M	Athletic	20.8 ± 1.16	Cycling, maximal	
Iri 2011	24	M	Athletic	21.9 ± 2.1	Cycling, 70% $\dot{V}O_2$ max, 30 min	Serum
Kaczmarek 1999	20	M	Untrained	29.2 ± 10.8	Running, maximal	Serum
Karakuc 2013	32	M	Untrained	12.8 ± 0.7	Boxing training, 60 min	Serum
Kaya 2008 ⁵	10	M	Athletic	20.4 ± 0.8	Futsal match	Serum, urine
Khaled 1997	9	M	Athletic	23.6 ± 3.4	Cycling, maximal	Serum
	12	M	Athletic	25.0 ± 3.2	Cycling, maximal	
Khaled 1999	10	M	Untrained	26.0 ± 1.3	Cycling, 85% $\dot{V}O_2$ max, 25 min	Serum
Koc 2010 ⁵	30	M	Athletic	19.6 ± 1.1	Wrestling training, 60 min	Serum
Kondo 1990	8	M	Untrained	44 ± 12	Cycling, 70% $\dot{V}O_2$ max, 20 min	Serum
Lukaski 1984	5	M	Untrained	32.2 ± 14.1	Cycling, maximal	Serum
Marella 1993	16	M	Athletic	30.1 ± 3.8	Running, marathon	Serum
Ohno 1983 ⁵	5	M	Untrained	21-23	Cycling, 30 min	RBC
Ohno 1985	11	M	Untrained	20.3 ± 1.0	Cycling, 75% $\dot{V}O_2$ max, 30 min	Serum, RBC
Ohno 1990	7	M	Untrained	18-19	Cycling, maximal	Serum
Omokhodion 1994 ⁵	15	M	Untrained	20-35	Cycling, 4 x 10 min	Sweat
Polat 2011	8	M	Untrained	12-14	Kickboxing training, 90-120 min	Serum
	8	M	Untrained	12-14	Kickboxing training, 90-120 min	
	8	M	Untrained	12-14	Kickboxing training, 90-120 min	
Savas 2006 ⁵	12	M	Untrained	21.7 ± 0.9	Running, maximal	Serum
Savas 2007 ⁵	16	M	Untrained	19.4 ± 1.6	Running, maximal	Serum
Savas 2009 ⁵	16	M	Untrained	22.7 ± 1.9	Running, maximal	Serum
	16	M	Untrained	21.6 ± 1.9	Swimming, 100 m	
Simpson 1991	8	M	Untrained	21-30	Cycling, 75% $\dot{V}O_2$ max, 60 min	Serum
	8	M	Moderately trained	21-30	Cycling, 75% $\dot{V}O_2$ max, 60 min	
	8	M	Athletic	21-30	Cycling, 75% $\dot{V}O_2$ max, 60 min	
Singh 1992	6	M	Moderately trained	30.3 ± 4.7	Running, 62.5% $\dot{V}O_2$ max, 120 min	Serum, urine

Singh 1994	5	M	Moderately trained	33 ± 3	Running, 72.5% $\dot{V}O_2$ max, 120 min	Serum, sweat, urine
Tipton 1993 ⁵	9	M	Moderately trained	27.3 ± 3.5	Cycling, 50% $\dot{V}O_2$ max, 60 min	Sweat
	9	F	Moderately trained	28.7 ± 3.3	Cycling, 50% $\dot{V}O_2$ max, 60 min	
Van Rij 1986	7	M	Untrained	NP ⁴	Running, 10 min	Serum
	7	M	Moderately trained	NP ⁴	Running, 10 miles	
Vlcek 1989	13	M	Moderately trained	23 ± 6	Cycling, maximal	Serum, sweat
Volpe 2007	12	M	Untrained	28.8 ± 2.9	Cycling, maximal	Serum

¹ Training status derived from description of study population in the studies.

² Given as mean ± S.D. or range where available

³ Mode of exercise, relative intensity and duration where available

⁴ Not provided in paper

⁵ Insufficient data available for meta-analysis