

## Supplementary Material

Table SI1: Micronutrient status of WZ+ subjects and Negative controls.

Micronutrient Marker	WZ+		WZ-	
	Lower <sup>a</sup>	Elevated <sup>b</sup>	Lower <sup>a</sup>	Elevated <sup>b</sup>
<b>Extracellular Markers</b>				
Vitamin A Serum	5/270(1.9%)	48/270(17.7%)	0/29(0%)	7/29(24.1%)
Vitamin B1 Serum	55/270(20.4%)	7/270(2.6%)	7/29(24.1%)	3/29(10.3%)
Vitamin B2 Serum	82/270(30.4%)	1/270(0.4%)	1/29(3.1.0%)	0/29(0%)
Vitamin B3 Serum	10/270(3.7%)	4/270(1.5%)	4/29(3.44%)	1/29(3.4%)
Vitamin B5 Serum	3/270(1.1%)	15/270(5.6%)	15/29(3.44%)	5/29(17.2%)
Vitamin B6 Serum	10/270(3.7%)	2/270(0.7%)	0/29(0%)	0/29(0%)
Vitamin B12 Serum	2/277(0.7%)	43/277(15.5%)	0/35(0%)	8/35(22.9%)
Vitamin C Serum	52/270(19.3%)	16/270(5.9%)	16/29(13.8%)	1/29(3.4%)
Vitamin D3 Serum	115/270(42.6%)	1/270(0.4%)	1/29(44.2%)	0/29(0%)
Vitamin D, 25-OH Serum	66/284(23.2%)	2/284(0.7%)	7/35(20%)	0/35(0%)
Vitamin E Serum	7/270(2.6%)	8/270(3.0%)	0/29(0%)	1/29(3.4%)
Vitamin K1 Serum	23/270(8.5%)	1/270(0.4%)	1/29(13.8%)	0/29(0%)
Vitamin K2 Serum	236/270(87.4%)	0/270(0%)	0/29(89.7%)	0/29(0%)
Folate Serum	2/277(0.7%)	27/277(9.7%)	27/35(7.2%)	3/35(8.5%)
Calcium Serum	9/279(3.2%)	26/279(9.3%)	26/35(2.9%)	2/35(5.7%)
Manganese Serum	0/270(0%)	16/270(5.9%)	16/29(0%)	0/29(0%)
Magnesium Serum	0/279(0%)	2/279(0.7%)	2/34(0%)	0/34(0%)
Zinc Serum	62/270(23.0%)	1/270(0.4%)	1/29(17.2%)	0/29(0%)
Copper Serum	10/270(3.7%)	7/270(2.6%)	7/29(6.9%)	0/29(0%)
Chromium Serum	58/270(21.5%)	8/270(3.0%)	8/29(10.3%)	1/29(3.4%)
Iron Serum	17/277(6.1%)	22/277(7.9%)	22/36(2.7%)	2/36(5.6%)
Asparagine Serum	39/270(14.4%)	6/270(2.2%)	6/29(14.0%)	2/29(6.9%)
Glutamine Serum	11/270(4.1%)	22/270(8.1%)	22/29(3.4%)	3/29(10.3%)
Serine Serum	7/270(5.6%)	49/270(18.1%)	49/29(0%)	8/29(27.6%)
Choline Serum	13/270(4.8%)	18/270(6.7%)	18/29(3.4%)	3/29(10.3%)

Inositol Serum	15/270(5.6%)	18/270(6.7%)	18/29(3.4%)	2/29(6.9%)
Sodium Serum	11/281(3.9%)	24/281(8.5%)	24/36(5.6%)	5/36(13.8%)
Potassium Serum	1/278(0.4%)	11/278(4.0%)	11/35(0%)	2/35(5.1%)
Carnitine Serum	8/270(3.0%)	18/270(6.7%)	18/29(6.8%)	2/29(6.9%)
MMA Serum	0/270(0%)	1/270(0.4%)	1/29(0%)	0/29(0%)
Coenzyme Q10 Serum	6/279(2.2%)	61/279(21.9%)	0/34(0%)	15/34(44.1%)
Cysteine Serum	89/270(33.0%)	2/270(0.7%)	2/29(20.7%)	1/29(3.4%)
Selenium Serum	30/270(11.1%)	7/270(2.6%)	7/29(3.4%)	3/29(10.3%)
Glutathione Serum	267/270(98.9%)	1/270(0.4%)	29/29(100%)	0/29(0%)
<b>Intracellular Markers</b>				
DHA RBC	2/293(0.7%)	21/293(7.2%)	21/37(0%)	3/37(8.1%)
EPA RBC	30/293(10.2%)	45/293(15.4%)	45/37(2.7%)	10/37(27.0%)
DPA RBC	84/293(28.7%)	11/293(3.8%)	11/37(18.9%)	3/37(8.1%)
Total Omega-3 RBC	5/293(1.7%)	24/293(8.2%)	0/37(0%)	3/37(8.1%)
AA RBC	1/293(0.3%)	7/293(2.4%)	7/37(2.7%)	0/37(0%)
LA RBC	6/293(2.0%)	81/293(27.6%)	81/37(2.7%)	12/37(32.4%)
Total Omega-6 RBC	3/293(1.0%)	2/293(0.7%)	2/37(2.7%)	1/37(2.7%)
Omega-3 Index RBC	203/293(69.3%)	0/293(0%)	0/37(64.9%)	0/37(0%)
Folate RBC	20/280(7.1%)	0/280(0%)	0/31(9.7%)	0/31(0%)
Iron RBC	15/289(5.2%)	2/289(0.7%)	2/36(5.6%)	0/36(0%)
Magnesium RBC	2/290(0.7%)	3/290(1.0%)	0/36(0%)	0/36(1%)
Vitamin A WBC	9/277(3.2%)	4/277(1.4%)	0/30(0%)	1/30(3.3%)
Vitamin B1 WBC	82/276(29.7%)	73/276(26.4%)	73/30(46.7%)	8/30(26.7%)
Vitamin B2 WBC	0/276(0%)	136/276(49.3%)	136/30(0%)	15/30(50.0%)
Vitamin B3 WBC	3/276(1.1%)	20/276(7.2%)	0/30(0%)	1/30(3.3%)
Vitamin B5 WBC	7/276(2.5%)	132/276(47.8%)	132/30(3.3%)	17/30(56.7%)
Vitamin B6 WBC	28/276(10.1%)	65/276(23.6%)	65/30(3.3%)	10/30(33.3%)
Vitamin C WBC	13/276(4.7%)	22/276(8.0%)	22/30(3.3%)	1/30(3.3%)
Vitamin D3 WBC	9/277(3.2%)	89/277(32.1%)	89/30(3.3%)	10/30(33.3%)
Vitamin E WBC	2/277(0.7%)	27/277(9.7%)	0/30(0%)	4/30(13.3%)
Vitamin K1 WBC	97/277(35.0%)	16/277(5.8%)	9/30(30.0%)	5/30(16.7%)
Vitamin K2 WBC	236/277(85.2%)	5/277(1.8%)	5/30(83.3%)	1/30(3.3%)

Calcium WBC	6/267(2.2%)	29/267(10.9%)	29/30(0%)	7/30(23.3%)
Manganese WBC	1/266(0.4%)	51/266(19.2%)	51/30(0%)	11/30(36.7%)
Zinc WBC	9/266(3.4%)	3/266(1.1%)	0/30(0%)	3/30(10.0%)
Copper WBC	29/266(10.9%)	13/266(4.9%)	13/30(3.3%)	2/30(6.7%)
Chromium WBC	0/267(0%)	16/267(6.0%)	16/30(0%)	4/30(13.3%)
Choline WBC	1/276(0.4%)	9/276(3.3%)	0/30(0%)	0/30(0%)
Inositol WBC	23/276(8.3%)	7/276(2.5%)	7/30(3.3%)	1/30(3.3%)
Carnitine WBC	14/276(5.1%)	3/276(1.1%)	0/30(0%)	0/30(0%)
MMA WBC	0/276(0%)	49/276(17.8%)	49/30(0%)	4/30(13.3%)
Asparagine WBC	1/276(0.4%)	88/276(31.9%)	88/30(0%)	11/30(36.7%)
Glutamine WBC	36/276(13.0%)	7/276(2.5%)	7/30(3.3%)	1/30(3.3%)
Serine WBC	0/276(0%)	66/276(23.9%)	66/30(0%)	8/30(26.7%)
Glutathione WBC	22/276(8.0%)	19/276(6.9%)	3/30(10.0%)	3/30(10%)
Cysteine WBC	14/276(5.1%)	5/276(1.8%)	0/30(0%)	0/30(0%)
Selenium WBC	1/266(0.4%)	35/266(13.2%)	0/30(0%)	9/30(30.0%)
Coenzyme Q10 WBC	5/277(1.8%)	10/277(3.6%)	0/30(0%)	1/30(3.3%)

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<sup>a</sup> Lower – lower than the reference range., <sup>b</sup>Elevated – Greater than the reference range, RBC- Red Blood Cells, WBC – White Blood Cells