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INTI – OAA – IAAC T 007 2011 PROFICIENCY TESTING PROGRAM

“MINERALS Y VITAMIN C IN POWDER MILK”

FINAL REPORT

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1. INTRODUCCIÓN

Due to the market and quality systems requirements, the testing and calibration laboratories should demonstrate the quality of their measurements participating in proficiency testing (PT) exercises.

Taking into consideration such requirements the IAAC Laboratories Subcommittee is promoting the organization of proficiency testing exercises within the region.

The Argentinean Accreditation Body (OAA) and INTI (National Institute of Industrial Technology), as PT provider, are collaborating with IAAC in this activity.

Until now five exercises have been organized: INTI – OAA – IAAC T 001 2006 “Water analysis”, INTI – OAA – IAAC T002 2008 “Meat analysis”, INTI – OAA – IAAC T003 2009 “Fatty acids composition of edible vegetable oils” , INTI – OAA – IAAC T 005 2010 “Preservatives in Non Alcoholic Beverages” and INTI – OAA – IAAC T007 2011 “Minerals and Vitamin C in Powder Milk”

In 2006 exercise the participant laboratories were 70 laboratories from IAAC region and 30 laboratories from APLAC (Asia – Pacific) region.

In 2008 exercise the participant laboratories are 53 laboratories from IAAC region, 7 laboratories from APLAC region and 10 laboratories from SADCA (South Africa) region.

In 2009 exercise the participant laboratories are 38 laboratories from IAAC region, 13 laboratories from APLAC region and 3 laboratories from SADCA (South Africa) region.

In 2010 exercise the participant laboratories are 23 laboratories from IAAC region, 13 laboratories from APLAC region and 1 laboratory from SADCA (South Africa) region.

In the present exercise, the participant laboratories are 32 from IAAC region, 4 laboratories from APLAC region and 1 laboratory from SADCA (South Africa) region.

2. SAMPLES

2.1. Sample Preparation

Samples consist of two commercial types of powder milk fortified with calcium, iron, vitamin A, C and D.

For each type of powder milk, we used 7 kg of a same batch. We homogenized them in a polypropylene container.

Then, we separated them in polythene containers of approximately 100 g each one.

We assessed homogeneity and stability obtaining satisfactory results

2.2. Homogeneity

To asses homogeneity, 10% of the simples were analyzed. The results obtained were satisfactory compared to the repeatability of the measurement method.

2.3. Stability

Samples were analyzed after a period of time similar to the one that would pass until the participants analyze the samples. Comparing with the results obtained in the homogeneity tests, the results obtained were satisfactory.

2.4. Reference Values

To asses the performance of the participant laboratories the consensus value, estimated as described in 4 was used.



3. RESULTS REPORTED BY PARTICIPANT LABORATORIES

3.1. Results

The results reported by participant laboratories are given in Tables 1 and 2 (Annex 1). The number of significant figures and units appear exactly as they were reported by the laboratories.

In graphs 1 to 16 (Annex 2) are shown the results reported by participant laboratories along with the reported uncertainty.

It can also be observed in these graphs, the consensus mean value and standard deviation obtained as is described in item. 4.

3.2. Methods

Participants used the analytical method of their choice to perform the tests. A summary of the methods used by participants is shown in Table 3. Table 4 shows the accredited tests for each participant.

4. STATISTICAL PROCEDURE FOR THE ANALYSIS OF RESULTS

The following method was used to estimate the consensus value and the interlaboratory standard deviation:

Robust Method ISO 5725

The consensus value was estimated as the robust mean of the results reported by participating laboratories. The robust mean was calculated using Algorithm A as described in ISO 5725. (1994) Part 5 (ref. 1)

In this exercise, no anomalous result is discarded before putting this method into practice.

The robust standard deviation was estimated using Algorithm A also described in ISO 5725.

A summary of results obtains through this method is shown in the following table.

Sample A	Mean Value	Standard Deviation	Relative Standard Deviation (%)	Uncertainty of Mean Value
Vitamin C (mg/kg)	558,3	100,2	18,0	31,3
Calcium (mg/100g)	891,4	110,3	12,4	27,0
Zinc (mg/kg)	29,2	4,5	15,4	1,1
Phosphorus (mg/100g)	692,9	101,3	14,6	25,9
Iron (mg/kg)	127,4	29,8	23,4	6,9
Magnesium (mg/100g)	89,5	9,9	11,1	2,5
Potassium (mg/100g)	1192,4	106,5	8,9	26,6
Sodium (mg/100g)	374,9	33,4	8,9	7,9

Sample B	Mean Value	Standard Deviation	Relative Standard Deviation (%)	Uncertainty of Mean Value
Vitamin C (mg/kg)	664,1	132,0	19,9	41,2
Calcium (mg/100g)	1536,6	251,2	16,3	62,8
Zinc (mg/kg)	39,6	4,1	10,2	1,0
Phosphorus (mg/100g)	896,4	150,8	16,8	42,1
Iron (mg/kg)	110,7	22,9	20,7	5,3
Magnesium (mg/100g)	121,8	11,4	9,4	2,9
Potassium (mg/100g)	1556,6	169,7	10,9	43,3
Sodium (mg/100g)	497,7	46,4	9,3	11,2

The deviations between each laboratory mean value and the consensus value for each analyte can be observed on Table 5



5. ASSESSMENT OF PERFORMANCE

The assessment of performance for the participating laboratories was realized according to international standards quoted in bibliography.

The performance criterion used was “z score”, defined as:

$$z = (x_{1/2} - x_{ref}) / s_L$$

where:

$x_{1/2}$ = average for each analyte and participant laboratory = $\sum x_i / r$

x_{ref} = consensus value for each analyte in the sample (estimated by robust method ISO 5725, as described in 4.).

r = number of reported results for each analyte (1, 2, 3)

s_L = standard deviation (s_L was estimated by robust method ISO 5725, as described in 4.)

The calculated “z scores” for each analyte and participant laboratory are shown in Table 6 and graphs 17 to 32.

In accordance with reference standards, it is possible to classify scores as:

$|z| \leq 2$ satisfactory, $2 < |z| < 3$ questionable, $|z| \geq 3$ unsatisfactory

6. COMMENTS

A summary of the number of satisfactory, questionable and non satisfactory determinations evaluated by z score is shown in the following table:

Sample A	$ Z \leq 2$	$2 < Z < 3$	$ Z \geq 3$
Vitamin C	16	-	1
Calcium	21	1	4
Zinc	23	2	1
Phosphorus	20	1	3
Iron	29	-	1
Magnesium	18	1	6
Potassium	21	1	3
Sodium	26	1	2

Sample B	$ Z \leq 2$	$2 < Z < 3$	$ Z \geq 3$
Vitamin C	16	-	1
Calcium	21	4	-
Zinc	23	3	-
Phosphorus	17	2	1
Iron	26	1	3
Magnesium	20	1	4
Potassium	22	1	1
Sodium	25	3	2

- Participants submitted their results with different number of significant figures. The laboratories should be aware that this number should be in agreement with the uncertainty of that particular measurement
- 50% of the participants do not estimate uncertainty. Some of the participants that do report uncertainty may be evaluating it incorrectly. These are some examples:
 - Laboratories that submit too low uncertainty: 12, 16, 23, etc.
 - Laboratories that submit too high uncertainty: 13, etc.
 - Laboratories with replicates that vary more than their reported uncertainty: 23, 24, etc

**ANNEX 1
TABLES**

**Table 1 - Results Reported By Participant Laboratories
Sample A**

Part	Sample	Vitamin C (mg/kg)				Iron (mg/kg)				Zinc (mg/kg)				Phosphorus (mg/100 g)			
		Result 1	Result 2	Result 3	U	Result 1	Result 2	Result 3	U	Result 1	Result 2	Result 3	U	Result 1	Result 2	Result 3	U
1	29	748,0	748,0	748,0	ni	130,70	130,70	130,70	5,14	48,40	48,40	48,40	8,64	ni	ni	ni	ni
2	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
3	41	ni	ni	ni	ni	90,1	90,5	92,5	ni	32,87	31,14	31,94	ni	765,83	765,81	746,74	ni
4	ni	614,7	619,7	620,2	ni	124,52	125,38	126,12	ni	21,92	22,64	21,07	ni	664,5	681,9	681,3	ni
5	ni	610	610	610	30	103	102	102	6	40	40	41	2,5	923	928	927	46
6	ni	593,0	597,5	608,4	ni	123,5	125,8	123,6	ni	ni	ni	ni	ni	747	753	750	ni
7	49	428	418	429	2,9	110	111	112	2,3	22	22	25	6	304	307	306	10
8	48	*534,5	*528,8	*531,6	4,7	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
9	ni	ni	ni	ni	ni	156	151	158	9,0	29,1	27,8	29,1	1,1	723	695	737	29
10	ni	ni	ni	ni	ni	91,75	89,57	94,11	ni	24,36	24,39	24,60	ni	ni	ni	ni	ni
11	ni	ni	ni	ni	ni	150	148	ni	ni	22,0	20,5	ni	ni	ni	ni	ni	ni
12	ni	429,0	424,1	438,0	10,0	143,5	142,8	142,2	2,0	26,6	27,9	27,9	2,8	198	198	202	5,0
13	ni	ni	ni	ni	ni	148	146	147	18%	27,0	26,3	26,3	20%	778	778	787	10%
14	9	ni	ni	ni	ni	103	106	112	ni	ni	ni	ni	ni	732	738	759	ni
15	ni	546,08	546,10	546,30	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
16	52	ni	ni	ni	ni	8,40	8,23	7,36	0,67	ni	ni	ni	ni	720	716	699	12,88
17	13	560,0	537,6	528,0	ni	118,89	102,96	116,64	ni	25,17	25,69	23,11	ni	734,56	756,41	756,48	ni
18	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
19	ni	599,3	728,2	518,1	8,15	176,8	167,8	162,3	ni	40,6	39,4	39,1	ni	778	763	762	ni
20	ni	518	562	548	ni	154,74	156,05	155,47	ni	28,74	28,96	28,25	ni	734,0	729,7	729,6	
21	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
22	56	678,0	679,0	ni	ni	68,80	74,20	74,80	ni	26,40	26,30	26,50	ni	ni	ni	ni	ni
23	Ni	436,95	432,53	422,81	0,010	139,94	139,16	141,39	0,02	32,45	33,77	33,68	0,03	ni	ni	ni	ni
24	7	ni	ni	ni	ni	64,74	68,58	65,60	0,45	26,94	25,14	27,50	3,31	728,73	711,19	715,60	2,57
25	Ni	ni	ni	ni	ni	130,75	132,4	132,15	ni	30,00	31,25	30,95	ni	ni	ni	ni	ni
26	Ni	466,37	467,02	466,57	10,54	131,66	129,77	131,87	19,55	36,45	33,82	36,87	1,21	521,22	489,16	526,00	6,21
27	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
28	30	589,1	570,2	572,9	47,3	135	132	138	14	28,1	28,1	28,7	3,7	719	719	714	40
29	18	ni	ni	ni	ni	160,7	156,5	156,4	ni	ni	ni	ni	ni	732,5	730,7	736,3	ni
30	43	ni	ni	ni	ni	150,17	151,19	148,15	ni	29,31	29,39	29,97	ni	268,54	274,73	293,48	ni
31	51	ni	ni	ni	ni	114,5	115,7	115,6	9,8	28,54	28,63	28,62	1,88	6805**	7340**	6979**	251**
32	17	1312	1305	1355	ni	141	141	146	ni	30	28	26	ni	798	732	777	ni
33	ni	ni	ni	ni	ni	180	174	170	1	31	31	29	1	594	610	591	19
34	50	511	557	533	ni	152	151	151	ni	28	26	26	ni	737	732	732	ni
35	42	578	577	577	ni	104	97,4	124	ni	28,7	26,8	30,7	ni	526	556	582	ni
36	5	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	677,0	740,7	696,5	ni
37	ni	ni	ni	ni	ni	142,9	144,1	148,0	ni	33,2	31,8	30,9	ni	ni	ni	ni	ni

*Part 8: it also informs ascorbic acid. Result 1: 463,7/ Result 2: 451,2/ Result 3:457,4

** Part 31: it informs Phosphorus in mg/kg

ni: no data reported

**Table 1 (cont) - Results Reported By Participant Laboratories
Sample A**

Part	Magnesium (mg/100 g)				Potassium (mg/100 g)				Calcium (mg/100 g)				Sodium (mg/100 g)			
	Result 1	Result 2	Result 3	U	Result 1	Result 2	Result 3	U	Result 1	Result 2	Result 3	U	Result 1	Result 2	Result 3	U
1	119,09	119,09	119,09	9,32	1443,00	1443,00	1508,20	8,50	1333,20	1483,10	1333,20	5,2	400,70	422,60	444,40	9,96
2	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
3	88,08	90,99	89,59	ni	1268,58	1242,33	1308,84	ni	920,48	912,86	935,13	ni	399,26	396,91	389,15	ni
4	151,3	150,79	150,4	ni	ni	ni	ni	ni	1275	1304	1282	ni	370	365	367	ni
5	122	122	122	6	1680	1720	1660	90	1670	1760	1680	99	490	490	490	25
6	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
7	84,9	84,2	86,9	4	1254	1244	1253	17	875	865	870	15	286	287	288	15
8	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
9	82,5	79,5	83,3	3,0	1105	1003	1060	37	907	876	920	41	375	360	418	15
10	84,88	84,50	84,04	ni	1182,50	1121,55	1056,93	ni	614,23	625,29	635,32	ni	417,86	432,95	419,89	ni
11	127,4	122,4	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	399,7	387,2	ni	ni
12	90,2	91,9	91,6	3,0	1150	1144,2	1130,9	31,6	849,7	843,6	853,0	22,5	356,5	360,6	352,6	6,0
13	93,8	94,3	94,5	18%	1140	1139	1130	15%	980	976	968	15%	421	420	417	21%
14	ni	ni	ni	ni	ni	ni	ni	ni	955	950	1004	ni	379	386	384	ni
15	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
16	115	114	113	1,15	1140	1140	1150	6,67	869	863	872	5,29	347	340	349	5,46
17	85,76	85,69	85,26	ni	1262,25	1248,69	1259,32	ni	871,54	838,59	820,91	ni	358,96	348,79	344,98	ni
18	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
19	91	92	92	ni	1228	1195	1212	ni	931	927	926	ni	364	378	378	ni
20	91,2	90,4	89,9	ni	1220,5	1206,0	1195,4	ni	974,8	971,8	983,2	ni	359,5	356,5	351,2	ni
21	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
22	ni	ni	ni	ni	1217,6	1249,8	1225,3	ni	1003,9	1009,9	1000,2	ni	351,0	343,1	364,6	ni
23	84,26	82,54	83,40	0,02	1193,98	1167,23	1218,03	0,03	ni	ni	ni	ni	406,73	406,23	412,10	0,02
24	93,72	86,13	93,72	3,35	962,68	1032,98	990,80	48,97	940,6	920,4	935,5	1,1	372,36	375,93	370,15	16,67
25	ni	ni	ni	ni	741,00	746,70	749,10	ni	798,95	818,00	785,10	ni	368,50	376,50	367,00	ni
26	91,76	92,42	91,18	1,11	808,64	873,90	810,41	32,72	773,29	785,43	746,38	14,69	378,34	389,01	372,09	2,44
27	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
28	86,4	88,1	86,4	7	1173	1178	1171	61	824	832	840	46	340	343	347	22
29	ni	ni	ni	ni	ni	ni	ni	ni	859,9	873,7	899,7	ni	ni	ni	ni	ni
30	44,76	43,08	43,50	ni	1127,22	1146,79	1137,48	ni	478,47	458,09	456,55	ni	364,29	366,56	363,50	ni
31	778**	819**	821**	48**	11551**	12132**	11680**	1620**	8279**	8112**	8033**	826**	3252**	3568**	3522**	412**
32	88	78	82	ni	1262	1202	1256	ni	838	678	715	ni	397	390	363	ni
33	100	94	101	2	1303	1274	1308	15	864	858	841	2	371	373	377	3
34	87	87	87	ni	1266	1285	1267	ni	920	917	923	ni	367	363	366	ni
35	35,1	33,1	33,1	ni	1337	1307	1277	ni	ni	ni	ni	ni	345	301	328	ni
36	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	938,4	954,0	945,7	ni
37	83,5	87,5	83,4	ni	1193,7	1180,5	1174,4	ni	911,5	878	922,6	ni	371,5	361,5	350,1	ni

** Part 31: it informs results in mg/kg ni: no data reported

**Table 2 - Results Reported By Participant Laboratories
Sample B**

Part	Sample	Vitamin C (mg/kg)				Iron (mg/kg)				Zinc (mg/kg)				Phosphorus (mg/100 g)			
		Result 1	Result 2	Result 3	U	Result 1	Result 2	Result 3	U	Result 1	Result 2	Result 3	U	Result 1	Result 2	Result 3	U
1	38	745,3	745,3	745,3	ni	112,16	110,48	111,04	5,14	37,40	37,94	36,83	8,64	ni	ni	ni	ni
2	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
3	55	ni	ni	ni	ni	29,46	29,5	31,0	ni	42,11	41,31	42,43	ni	1024,36	1029,57	1035,93	ni
4	ni	723,9	726,5	725,7	ni	117	116	117	ni	32,21	33,59	30,84	ni	805,7	846,0	831,5	ni
5	ni	870	880	880	44	156	144	155	8	28	29	30	1,5	ni	ni	ni	ni
6	ni	748,0	742,5	729,8	ni	113,3	114,7	113,1	ni	ni	ni	ni	ni	988	983	985	ni
7	27	523	510	517	2,5	93	97	95	2,3	40	41	42	6	500	517	512	10
8	14	*573,7	*577,5	*575,7	4,7	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
9	ni	ni	ni	ni	ni	129	131	127	7,5	36,6	39,1	37,8	1,5	ni	ni	ni	ni
10	ni	ni	ni	ni	ni	97,79	93,98	93,48	ni	43,80	39,59	43,32	ni	ni	ni	ni	ni
11	ni	ni	ni	ni	ni	148	144	ni	ni	31,2	30,8	ni	ni	ni	ni	ni	ni
12	ni	499,5	487,8	487,6	10,0	120,7	120,4	121,9	2,0	37,7	38,7	37,9	2,8	ni	ni	ni	ni
13	ni	ni	ni	ni	ni	119	119	118	18%	35,2	35,1	35,0	20%	ni	ni	ni	ni
14	53	ni	ni	ni	ni	101	98	92	ni	ni	ni	ni	ni	996	1000	972	ni
15	ni	578,21	578,68	578,20	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
16	58	ni	ni	ni	ni	9,17	7,64	5,87	1,76	ni	ni	ni	ni	947	968	944	15,10
17	ni	640,0	633,6	643,2	ni	117,31	107,15	120,35	ni	33,48	35,89	35,77	ni	988,29	983,66	985,91	ni
18	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
19	ni	556,0	838,1	715,4	8,15	158,5	139,6	139,9	ni	45,5	50,0	48,8	ni	1038	1048	1045	ni
20	ni	601	612	619	ni	127,89	127,50	129,40	ni	38,75	36,68	36,97	ni	984,2	983,2	986,1	ni
21	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
22	50	547,0	546,0	ni	ni	31,0	37,7	32,9	ni	38,0	37,3	37,3	ni	ni	ni	ni	ni
23	ni	735,36	699,20	729,94	0,016	125,77	128,04	126,91	0,02	45,16	45,44	46,41	0,02	ni	ni	ni	ni
24	20	ni	ni	ni	ni	48,59	49,30	50,56	0,34	36,34	39,54	38,45	4,75	992,21	964,49	975,35	3,49
25	ni	ni	ni	ni	ni	108,25	106,95	107,8	ni	44,5	44,30	44,25	ni	ni	ni	ni	ni
26	ni	462,09	462,12	462,57	10,52	109,42	109,87	104,81	16,11	46,80	46,47	45,47	1,55	716,27	724,96	700,82	8,66
27	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
28	29	661,4	654,1	668,2	53,6	104	110	114	12	39,0	38,7	38,9	4,8	917	940	943	50
29	30	ni	ni	ni	ni	135,7	129,8	129,6	ni	ni	ni	ni	ni	975,5	973,2	971,2	ni
30	6	ni	ni	ni	ni	127,44	125,05	126,34	ni	41,62	41,04	41,31	ni	351,70	345,51	347,70	ni
31	5	ni	ni	ni	ni	99,3	100,0	100,7	7,1	38,70	38,65	38,92	3,46	10616**	10510**	10053**	637**
32	33	1574	1533	1580	ni	124	111	123	ni	39	39	38	ni	731	862	898	ni
33	ni	ni	ni	ni	ni	122	120	127	1	42	36	34	1	763	747	718	19
34	4	610	625	624	ni	123	125	123	ni	41	41	41	ni	970	972	969	ni
35	34	669	689	691	ni	59,3	66,9	66,9	ni	42,9	41,2	42,6	ni	558	560	461	ni
36	48	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	926,2	952,1	932,6	ni
37	ni	ni	ni	ni	ni	120,7	123,2	123,1	ni	41,7	41,9	40,7	ni	ni	ni	ni	ni

*Part 8: it also informs ascorbic acid. Result 1: 547,8/ Result 2: 564,2/ Result 3:554,7

** Part 31: it informs Phosphorus in mg/kg

ni: no data reported

**Table 2 (cont) - Results Reported By Participant Laboratories
Sample B**

Part	Magnesium (mg/100 g)				Potassium (mg/100 g)				Calcium (mg/100 g)				Sodium (mg/100 g)			
	Result 1	Result 2	Result 3	U	Result 1	Result 2	Result 3	U	Result 1	Result 2	Result 3	U	Result 1	Result 2	Result 3	U
1	106,00	94,86	117,18	9,32	1674,01	1584,73	1584,73	8,50	1312,40	1312,40	1312,40	5,20	431,89	426,26	434,07	9,96
2	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
3	121,36	121,23	121,67	ni	1689,22	1665,41	1688,61	ni	1657,99	1657,58	1660,17	ni	522,90	521,70	518,12	ni
4	200	201	203	ni	ni	ni	ni	ni	2276	2288	2262	ni	390	364	329	ni
5	85	86	84	4,5	1260	1290	1240	63	937	905	890	46	360	360	350	18
6	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
7	138,1	138,2	138,4	4	1780	1782	1784	12	1455	1455	1455	15	395	390	395	10
8	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
9	120	121	117	4,4	1460	1450	1390	50	1670	1680	1650	77	525	543	503	20
10	128,58	128,64	128,96	ni	1436,1	1413,77	1410,51	ni	1367,09	1387,51	1383,96	ni	541,78	546,77	539,64	ni
11	134,8	124,8	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	386,8	374,4	ni	ni
12	120,9	120,0	122,8	3,0	1638,2	1604,9	1638,2	31,6	1491,0	1469,2	1430,4	22,5	481,2	490,9	492,3	6,0
13	129	129	129	18%	1510	1530	1500	15%	1790	1800	1780	15%	499	501	490	21%
14	ni	ni	ni	ni	ni	ni	ni	ni	1872	1864	1814	ni	527	533	547	ni
15	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
16	150	151	151	0,67	1480	1510	1510	20,00	1240	1250	1270	17,64	490	516	517	17,68
17	116,99	118,78	114,54	ni	1521,42	1523,28	1537,51	ni	1420,58	1420,50	1455,82	ni	451,5	452,54	450,23	ni
18	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
19	128	128	125	ni	1618	1573	1639	ni	1744	1796	1764	ni	507	514	507	ni
20	127,7	127,9	127,9	ni	1573,9	1602,3	1592,3	ni	1720,0	1734,1	1706,6	ni	478,9	487,8	486,7	ni
21	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
22	ni	ni	ni	ni	1628,6	1507,5	1581,0	ni	1791,9	1782,5	1748,8	ni	452,4	425,0	498,7	
23	114,34	114,60	114,47	0,01	ni	ni	ni	ni	ni	ni	ni	ni	524,38	531,59	527,98	0,01
24	122,17	126,47	117,85	4,49	1326,3	1299,3	1310,8	64,55	1728,1	1699,9	1679,6	2,01	517,6	540,1	530,5	23,67
25	ni	ni	ni	ni	763,70	770,30	752,70	ni	1445,50	1425,00	1442,00	ni	492,50	500,50	495,00	ni
26	125,82	128,42	127,32	1,54	1194,2	1044,49	1010,86	4	893,49	851,33	897,55	16,8	515,04	505,83	553,24	3,38
27	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
28	121	114	120	9	1566	1579	1626	80	1519	1532	1531	76	490	488	491	29
29	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
30	60,98	59,94	60,28	ni	1633,42	1630,34	1625,04	ni	824,10	816,00	817,42	ni	499,95	495,87	497,94	ni
31	1262**	1265**	1281**	78**	15739**	15822**	15538**	2353**	15003**	14766**	14509**	1558**	5782**	5609**	5664**	429**
32	125	125	117	ni	1658	1697	1743	ni	1582	1622	1548	ni	537	499	497	ni
33	123	116	115	2	1880	1863	1825	15	1483	1425	1372	2	533	550	533	3
34	121	122	122	ni	1675	1659	1656	ni	1704	1695	1696	ni	497	490	496	ni
35	48,9	47,7	47,1	ni	1750	1733	1780	ni	ni	ni	ni	ni	489		460	ni
36	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	1149,8	1137,5	1130,5	ni
37	125,3	130,2	120,8	ni	1520,4	1551,5	1584,3	ni	1650,2	1618,9	1666,3	ni	463	460,5	456,6	ni

** Part 31: it informs results in mg/kg ni: no data reported

Table 3
Methods Reported by Participants

Part	Vitamin C	Sodium	Calcium	Magnesium	Iron	Zinc	Potassium	Phosphorus	
1	HPLC	AAS							
3	ni	ICP-OES							
4	volumetry	AAS					ni	Spectrophotometric	
5	volumetry (sample A) HPLC (sample B)	AAS						gravimetric	
6	volumetry	ni	ni	ni	Spectrophotometric	ni	ni	Spectrophotometric	
7	HPLC	AAS							
8	HPLC	ni	ni	ni	ni	ni	ni	ni	
9	ni	ICP-AES							
10	ni	AOAC 985.35						ni	
11	ni	AAS	ni	AAS	AAS	AAS	ni	ni	
12	AOAC 985.33	AOAC 985.35						AOAC 995.11	
13	ni	Spectrophotometric							
14	ni	potenciometric	Complexometric	ni	photometric	ni	ni	photometric	
15	HPLC	ni	ni	ni	ni	ni	ni	ni	
16	ni	ICP					ni	ni	ni
17	AOAC 985.33 2000	AOAC 1990						colorimetric	
19	HPLC	ICP-OES							
20	potenciometry	ICP-OES							
22	AOAC 985.33	ISO 8070		ni	IRAM FII 103:1981	ISO 8070		ni	
23	HPLC	ni	AOAC 991.25		AOAC 999.11		ni	ni	
24	ni	AAS	volumetry	AAS				Spectrophotometric	
25	ni	AAS		ni	AAS			ni	
26	IFU(1987) 17th	AOAC (2005) 984.27							
28	HPLC	AAS						AOAC 986.24	
29	ni	ni	volumetry	ni	Spectrophotometric UV-VIS	ni	ni	Spectrophotometric UV-Vis	
30	ni	AAS							Spectrophotometric
31	ni	NMKL 139:1991			AOAC 999.11:2002		NMKL 139:1991	LE 08:2002	
32	volumetry	AAS							colorimetrico
33	ni	ICP-OAS							
34	volumetry	AOAC 17th ed	AOAC 985.35				AOAC 990.23	ISO 2962	
35	AOAC 985.33							Spectrophotometric	
36	ni	AAS	ni	ni	ni	ni	AOAC 995.11 2007	ni	
37	ni	AAS							ni

ni: no data reported

Table 4
Accredited Laboratories

Part	Accredited test?							
	Vitamin C	Calcium	Zinc	Phosphorus	Iron	Magnesium	Potassium	Sodium
1	NO	NO	NO	na	NO	NO	NO	NO
2	YES	YES	YES	YES	YES	YES	YES	YES
3	na	NO	NO	NO	NO	NO	NO	NO
4	NO	NO	NO	NO	NO	NO	na	NO
5	ni	ni	ni	ni	ni	ni	ni	ni
6	NO	na	na	NO	NO	na	na	na
7	NO	YES	YES	YES	YES	YES	YES	YES
8	NO	na	na	na	na	na	na	na
9	ni	ni	ni	ni	ni	ni	ni	ni
10	na	NO	NO	na	NO	NO	NO	NO
11	na	na	NO	na	NO	NO	na	NO
12	NO	NO	NO	NO	NO	NO	NO	NO
13	na	YES	NO	NO	NO	NO	NO	YES
14	na	NO	na	NO	NO	na	na	NO
15	NO	na	na	na	na	na	na	na
16	na	NO	na	NO	NO	NO	NO	NO
17	NO	NO	NO	NO	NO	NO	NO	NO
18	YES	YES	YES	NO	YES	YES	YES	YES
19	YES	NO	NO	NO	NO	NO	NO	NO
20	YES	YES	YES	YES	YES	YES	YES	YES
21	ni	YES	ni	ni	YES	na	na	na
22	NO	NO	NO	na	NO	na	NO	NO
23	NO	na	NO	na	NO	NO	NO	NO
24	na	NO	NO	na	NO	NO	NO	NO
25	na	NO	NO	na	NO	na	NO	NO
26	YES	YES	YES	YES	YES	YES	YES	YES
27	NO	NO	NO	NO	na	na	na	na
28	YES	NO	NO	NO	NO	NO	NO	YES
29	na	NO	na	NO	NO	na	na	na
30	na	NO	NO	NO	NO	NO	NO	NO
31	na	NO	NO	NO	NO	NO	NO	NO
32	NO	NO	NO	NO	NO	NO	NO	NO
33	na	NO	NO	NO	NO	NO	NO	NO
34	NO	NO	NO	NO	NO	NO	NO	NO
35	NO	na	NO	NO	NO	NO	NO	NO
36	na	na	na	NO	na	na	na	NO
37	na	NO	NO	na	NO	NO	NO	NO

na: not analyzed
ni: no data reported

Table 5
Sample A – Deviation from consensus value

Part	Vitamin C (mg/kg)		Calcium (g/100 g)		Zinc (mg/kg)		Phosphorus (g/100 g)	
	Mean Value	% dev. from consensus value	Mean Value	% dev. from consensus value	Mean Value	% dev. from consensus value	Mean Value	% dev. from consensus value
1	748,0	34,0	1383,2	55,2	48,4	65,6	-	-
2	-	-	-	-	-	-	-	-
3	-	-	922,8	3,5	32,0	9,4	759,5	9,6
4	618,2	10,7	1287,0	44,4	21,9	-25,1	675,9	-2,5
5	610,0	9,3	1703,3	91,1	40,3	38,0	926,0	33,6
6	599,6	7,4	-	-	-	-	750,0	8,2
7	425,0	-23,9	870,0	-2,4	23,0	-21,3	305,7	-55,9
8	-	-	-	-	-	-	-	-
9	-	-	901,0	1,1	28,7	-1,9	718,3	3,7
10	-	-	624,9	-29,9	24,5	-16,3	-	-
11	-	-	-	-	-	-	-	-
12	430,4	-22,9	848,8	-4,8	27,5	-6,0	199,3	-71,2
13	-	-	974,7	9,3	26,5	-9,2	781,0	12,7
14	-	-	969,7	8,8	-	-	743,0	7,2
15	546,2	-2,2	-	-	-	-	-	-
16	-	-	868,0	-2,6	-	-	711,7	2,7
17	541,9	-2,9	843,7	-5,4	24,7	-15,6	749,2	8,1
18	-	-	-	-	-	-	-	-
19	615,2	10,2	928,0	4,1	39,7	35,8	767,7	10,8
20	542,7	-2,8	976,6	9,6	28,7	-2,0	731,1	5,5
21	-	-	-	-	-	-	-	-
22	-	-	1004,7	12,7	26,4	-9,7	-	-
23	430,8	-22,8	-	-	33,3	13,9	-	-
24	-	-	932,2	4,6	26,5	-9,2	718,5	3,7
25	-	-	800,7	-10,2	30,7	5,2	-	-
26	466,7	-16,4	768,4	-13,8	35,7	22,2	512,1	-26,1
27	-	-	-	-	-	-	-	-
28	577,4	3,4	832,0	-6,7	28,3	-3,2	717,3	3,5
29	-	-	877,8	-1,5	-	-	733,2	5,8
30	-	-	464,4	-47,9	29,6	1,1	278,9	-59,7
31	-	-	814,1	-8,7	28,6	-2,2	704,1	1,6
32	1324,0	137,2	743,7	-16,6	28,0	-4,2	769,0	11,0
33	-	-	854,3	-4,2	30,3	3,8	598,3	-13,6
34	533,7	-4,4	920,0	3,2	26,7	-8,8	733,7	5,9
35	577,3	3,4	-	-	28,7	-1,7	554,7	-19,9
36	-	-	-	-	-	-	704,7	1,7
37	-	-	904,0	1,4	32,0	9,4	-	-

Table 5 (cont.)
Sample A – Deviation from consensus value

Part	Iron (mg/kg)		Magnesium (g/100g)		Potassium (g/100g)		Sodium (g/100g)	
	Mean Value	% dev. from consensus value	Mean Value	% dev. from consensus value	Mean Value	% dev. from consensus value	Mean Value	% dev. from consensus value
1	130,7	2,6	119,1	33,1	1464,7	22,8	422,6	12,7
2	-	-	-	-	-	-	-	-
3	91,0	-28,5	89,6	0,1	1273,3	6,8	395,1	5,4
4	125,3	-1,6	150,8	68,5	-	-	367,3	-2,0
5	102,3	-19,7	122,0	36,3	1686,7	41,4	490,0	30,7
6	124,3	-2,4	-	-	-	-	-	-
7	111,0	-12,9	85,3	-4,6	1250,3	4,9	287,0	-23,4
8	-	-	-	-	-	-	-	-
9	155,0	21,7	81,8	-8,6	1056,0	-11,4	384,3	2,5
10	91,8	-27,9	84,5	-5,6	1120,3	-6,0	423,6	13,0
11	-	-	-	-	-	-	-	-
12	142,8	12,1	91,2	1,9	1141,7	-4,3	356,6	-4,9
13	147,0	15,4	94,2	5,3	1136,3	-4,7	419,3	11,9
14	107,0	-16,0	-	-	-	-	383,0	2,2
15	-	-	-	-	-	-	-	-
16	8,0	-93,7	114,0	27,4	1143,3	-4,1	345,3	-7,9
17	112,8	-11,4	85,6	-4,4	1256,8	5,4	350,9	-6,4
18	-	-	-	-	-	-	-	-
19	169,0	32,6	91,7	2,4	1211,7	1,6	373,3	-0,4
20	155,4	22,0	90,5	1,1	1207,3	1,2	355,7	-5,1
21	-	-	-	-	-	-	-	-
22	72,6	-43,0	-	-	1230,9	3,2	352,9	-5,9
23	140,2	10,0	83,4	-6,8	1193,1	0,1	408,4	8,9
24	66,3	-47,9	91,2	1,9	995,5	-16,5	372,8	-0,6
25	131,8	3,4	-	-	745,6	-37,5	370,7	-1,1
26	131,1	2,9	91,8	2,6	831,0	-30,3	379,8	1,3
27	-	-	-	-	-	-	-	-
28	135,0	6,0	87,0	-2,8	1174,0	-1,5	343,3	-8,4
29	157,9	23,9	-	-	-	-	-	-
30	149,8	17,6	43,8	-51,1	1137,2	-4,6	364,8	-2,7
31	115,3	-9,5	80,6	-9,9	1178,8	-1,1	344,7	-8,0
32	142,7	12,0	82,7	-7,6	1240,0	4,0	383,3	2,2
33	174,7	37,1	98,3	9,9	1295,0	8,6	373,7	-0,3
34	151,3	18,8	87,0	-2,8	1272,7	6,7	365,3	-2,6
35	108,5	-14,9	33,8	-62,3	1307,0	9,6	324,7	-13,4
36	-	-	-	-	-	-	946,0	152,3
37	145,0	13,8	84,8	-5,2	1182,9	-0,8	361,0	-3,7

Table 5 (cont.)
Sample B – Deviation from consensus value

n° part	Vitamin C (mg/kg)		Calcium (g/100 g)		Zinc (mg/kg)		Phosphorus (g/100 g)	
	Mean Value	% dev. from consensus value	Mean Value	% dev. from consensus value	Mean Value	% dev. from consensus value	Mean Value	% dev. from consensus value
1	745,3	12,2	1312,4	-14,6	37,4	-5,6	-	-
2	-	-	-	-	-	-	-	-
3	-	-	1658,6	7,9	42,0	6,0	1030,0	14,9
4	725,4	9,2	2275,3	48,1	32,2	-18,6	827,7	-7,7
5	876,7	32,0	910,7	-40,7	29,0	-26,7	-	-
6	740,1	11,4	-	-	-	-	985,3	9,9
7	516,7	-22,2	1455,0	-5,3	41,0	3,6	509,7	-43,1
8	-	-	-	-	-	-	-	-
9	-	-	1666,7	8,5	37,8	-4,4	-	-
10	-	-	1379,5	-10,2	42,2	6,7	-	-
11	-	-	-	-	-	-	-	-
12	491,6	-26,0	1463,5	-4,8	38,1	-3,8	-	-
13	-	-	1790,0	16,5	35,1	-11,3	-	-
14	-	-	1850,0	20,4	-	-	989,3	10,4
15	578,4	-12,9	-	-	-	-	-	-
16	-	-	1253,3	-18,4	-	-	953,0	6,3
17	638,9	-3,8	1432,3	-6,8	35,0	-11,5	986,0	10,0
18	-	-	-	-	-	-	-	-
19	703,2	5,9	1768,0	15,1	48,1	21,5	1043,7	16,4
20	610,7	-8,0	1720,2	12,0	37,5	-5,4	984,5	9,8
21	-	-	-	-	-	-	-	-
22	-	-	1774,4	15,5	37,5	-5,2	-	-
23	721,5	8,6	-	-	45,7	15,4	-	-
24	-	-	1702,5	10,8	38,1	-3,7	977,4	9,0
25	-	-	1437,5	-6,4	44,4	12,0	-	-
26	462,3	-30,4	880,8	-42,7	46,2	16,8	714,0	-20,3
27	-	-	-	-	-	-	-	-
28	661,2	-0,4	1527,3	-0,6	38,9	-1,8	933,3	4,1
29	-	-	-	-	-	-	973,3	8,6
30	-	-	819,2	-46,7	41,3	4,4	348,3	-61,1
31	-	-	1475,9	-3,9	38,8	-2,1	1039,3	15,9
32	1562,3	135,2	1584,0	3,1	38,7	-2,3	830,3	-7,4
33	-	-	1426,7	-7,2	37,3	-5,7	742,7	-17,1
34	619,7	-6,7	1698,3	10,5	41,0	3,6	970,3	8,2
35	683,0	2,8	-	-	42,2	6,7	526,3	-41,3
36	-	-	-	-	-	-	937,0	4,5
37	-	-	1645,1	7,1	41,4	4,7	-	-

Table 5 (cont.)
Sample B – Deviation from consensus value

n° part	Iron (mg/kg)		Magnesium (g/100g)		Potassium (g/100g)		Sodium (g/100g)	
	Mean Value	% dev. from consensus value	Mean Value	% dev. from consensus value	Mean Value	% dev. from consensus value	Mean Value	% dev. from consensus value
1	111,2	0,5	106,0	-13,0	1614,5	3,7	430,7	-13,5
2	-	-	-	-	-	-	-	-
3	30,0	-72,9	121,4	-0,3	1681,1	8,0	520,9	4,7
4	116,7	5,4	201,3	65,2	-	-	361,0	-27,5
5	151,7	37,0	85,0	-30,2	1263,3	-18,8	356,7	-28,3
6	113,7	2,7	-	-	-	-	-	-
7	95,0	-14,2	138,2	13,5	1782,0	14,5	393,3	-21,0
8	-	-	-	-	-	-	-	-
9	129,0	16,5	119,3	-2,1	1433,3	-7,9	523,7	5,2
10	95,1	-14,1	128,7	5,7	1420,1	-8,8	542,7	9,0
11	-	-	-	-	-	-	-	-
12	121,0	9,3	121,2	-0,5	1627,1	4,5	488,1	-1,9
13	118,7	7,2	129,0	5,9	1513,3	-2,8	496,7	-0,2
14	97,0	-12,4	-	-	-	-	535,7	7,6
15	-	-	-	-	-	-	-	-
16	7,6	-93,2	150,7	23,7	1500,0	-3,6	507,7	2,0
17	114,9	3,8	116,8	-4,2	1527,4	-1,9	451,4	-9,3
18	-	-	-	-	-	-	-	-
19	146,0	31,9	127,0	4,2	1610,0	3,4	509,3	2,3
20	128,3	15,8	127,8	4,9	1589,5	2,1	484,5	-2,7
21	-	-	-	-	-	-	-	-
22	33,9	-69,4	-	-	1572,4	1,0	458,7	-7,8
23	126,9	14,6	114,5	-6,1	-	-	528,0	6,1
24	49,5	-55,3	122,2	0,3	1312,1	-15,7	529,4	6,4
25	107,7	-2,8	-	-	762,2	-51,0	496,0	-0,3
26	108,0	-2,4	127,2	4,4	1083,2	-30,4	524,7	5,4
27	-	-	-	-	-	-	-	-
28	109,3	-1,2	118,3	-2,9	1590,3	2,2	489,7	-1,6
29	131,7	19,0	-	-	-	-	-	-
30	126,3	14,1	60,4	-50,4	1629,6	4,7	497,9	0,0
31	100,0	-9,7	126,9	4,2	1570,0	0,9	568,5	14,2
32	119,3	7,8	122,3	0,4	1699,3	9,2	511,0	2,7
33	123,0	11,1	118,0	-3,2	1856,0	19,2	538,7	8,2
34	123,7	11,7	121,7	-0,1	1663,3	6,9	494,3	-0,7
35	64,4	-41,9	47,9	-60,7	1754,3	12,7	-	-
36	-	-	-	-	-	-	1139,3	128,9
37	122,3	10,5	125,4	2,9	1552,1	-0,3	460,0	-7,6

Table 6
Sample A – Z Score

Part	Vitamin C	Calcium	Zinc	Phosphorus	Iron	Magnesium	Potassium	Sodium
1	1,9	4,5	4,3	-	0,1	3,0	2,6	1,4
2	-	-	-	-	-	-	-	-
3	-	0,3	0,6	0,7	-1,2	0,0	0,8	0,6
4	0,6	3,6	-1,6	-0,2	-0,1	6,2	-	-0,2
5	0,5	7,4	2,5	2,3	-0,8	3,3	4,6	3,4
6	0,4	-	-	0,6	-0,1	-	-	-
7	-1,3	-0,2	-1,4	-3,8	-0,5	-0,4	0,5	-2,6
8	-	-	-	-	-	-	-	-
9	-	0,1	-0,1	0,3	0,9	-0,8	-1,3	0,3
10	-	-2,4	-1,1	-	-1,2	-0,5	-0,7	1,5
11	-	-	-1,8	-	0,7	3,6	-	0,6
12	-1,3	-0,4	-0,4	-4,9	0,5	0,2	-0,5	-0,5
13	-	0,8	-0,6	0,9	0,7	0,5	-0,5	1,3
14	-	0,7	-	0,5	-0,7	-	-	0,2
15	-0,1	-	-	-	-	-	-	-
16	-	-0,2	-	0,2	-4,0	2,5	-0,5	-0,9
17	-0,2	-0,4	-1,0	0,6	-0,5	-0,4	0,6	-0,7
18	-	-	-	-	-	-	-	-
19	0,6	0,3	2,3	0,7	1,4	0,2	0,2	0,0
20	-0,2	0,8	-0,1	0,4	0,9	0,1	0,1	-0,6
21	-	-	-	-	-	-	-	-
22	1,2	1,0	-0,6	-	-1,8	-	0,4	-0,7
23	-1,3	-	0,9	-	0,4	-0,6	0,0	1,0
24	-	0,4	-0,6	0,3	-2,0	0,2	-1,8	-0,1
25	-	-0,8	0,3	-	0,1	-	-4,2	-0,1
26	-0,9	-1,1	1,4	-1,8	0,1	0,2	-3,4	0,1
27	-	-	-	-	-	-	-	-
28	0,2	-0,5	-0,2	0,2	0,3	-0,3	-0,2	-0,9
29	-	-0,1	-	0,4	1,0	-	-	-
30	-	-3,9	0,1	-4,1	0,8	-4,6	-0,5	-0,3
31	-	-0,7	-0,1	0,1	-0,4	-0,9	-0,1	-0,9
32	7,6	-1,3	-0,3	0,8	0,5	-0,7	0,4	0,3
33	-	-0,3	0,2	-0,9	1,6	0,9	1,0	0,0
34	-0,2	0,3	-0,6	0,4	0,8	-0,3	0,8	-0,3
35	0,2	-	-0,1	-1,4	-0,6	-5,6	1,1	-1,5
36	-	-	-	0,1	-	-	-	17,1
37	-	0,1	0,6	-	0,6	-0,5	-0,1	-0,4

Table 6 (cont.)
Sample B – Z Score

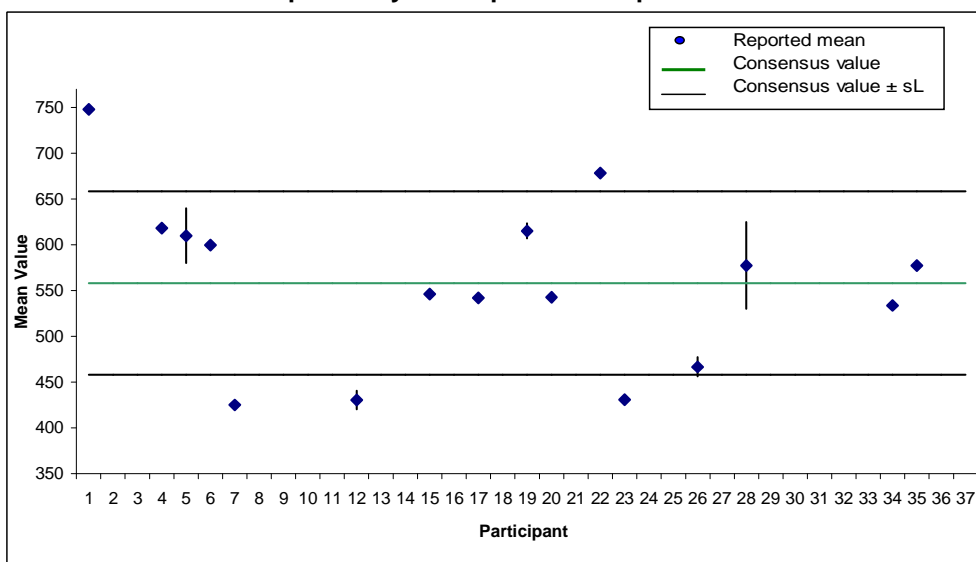
Part	Vitamin C	Calcium	Zinc	Phosphorus	Iron	Magnesium	Potassium	Sodium
1	0,6	-0,9	-0,5	-	0,0	-1,4	0,3	-1,4
2	-	-	-	-	-	-	-	-
3	-	0,5	0,6	0,9	-3,5	0,0	0,7	0,5
4	0,5	2,9	-1,8	-0,5	0,3	6,9	-	-2,9
5	1,6	-2,5	-2,6	-	1,8	-3,2	-1,7	-3,0
6	0,6	-	-	0,6	0,1	-	-	-
7	-1,1	-0,3	0,3	-2,6	-0,7	1,4	1,3	-2,2
8	-	-	-	-	-	-	-	-
9	-	0,5	-0,4	-	0,8	-0,2	-0,7	0,6
10	-	-0,6	0,7	-	-0,7	0,6	-0,8	1,0
11	-	-	-2,1	-	1,5	0,7	-	-2,5
12	-1,3	-0,3	-0,4	-	0,4	-0,1	0,4	-0,2
13	-	1,0	-1,1	-	0,3	0,6	-0,3	0,0
14	-	1,2	-	0,6	-0,6	-	-	0,8
15	-0,6	-	-	-	-	-	-	-
16	-	-1,1	-	0,4	-4,5	2,5	-0,3	0,2
17	-0,2	-0,4	-1,1	0,6	0,2	-0,4	-0,2	-1,0
18	-	-	-	-	-	-	-	-
19	0,3	0,9	2,1	1,0	1,5	0,5	0,3	0,2
20	-0,4	0,7	-0,5	0,6	0,8	0,5	0,2	-0,3
21	-	-	-	-	-	-	-	-
22	-0,9	0,9	-0,5	-	-3,4	-	0,1	-0,8
23	0,4	-	1,5	-	0,7	-0,6	-	0,7
24	-	0,7	-0,4	0,5	-2,7	0,0	-1,4	0,7
25	-	-0,4	1,2	-	-0,1	-	-4,7	0,0
26	-1,5	-2,6	1,6	-1,2	-0,1	0,5	-2,8	0,6
27	-	-	-	-	-	-	-	-
28	0,0	0,0	-0,2	0,2	-0,1	-0,3	0,2	-0,2
29	-	-	-	0,5	0,9	-	-	-
30	-	-2,9	0,4	-3,6	0,7	-5,4	0,4	0,0
31	-	-0,2	-0,2	0,9	-0,5	0,4	0,1	1,5
32	6,8	0,2	-0,2	-0,4	0,4	0,0	0,8	0,3
33	-	-0,4	-0,6	-1,0	0,5	-0,3	1,8	0,9
34	-0,3	0,6	0,3	0,5	0,6	0,0	0,6	-0,1
35	0,1	-	0,7	-2,5	-2,0	-6,5	1,2	-0,5
36	-	-	-	0,3	-	-	-	13,8
37	-	0,4	0,5	-	0,5	0,3	0,0	-0,8



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ANNEX 2 GRAPHS

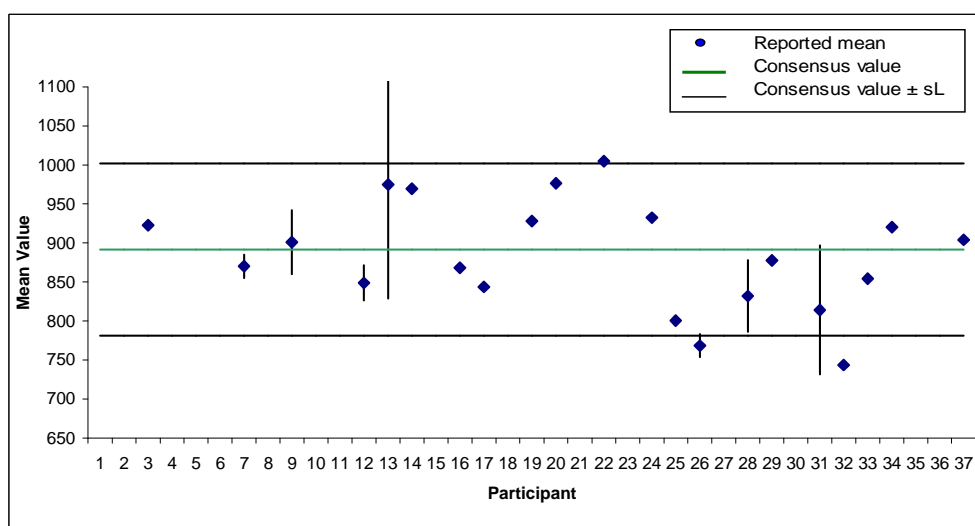
Graph 1
Values Reported by Participants - Sample A - Vitamin C



Out of Scale Participant

Lab	Mean value
32	1324

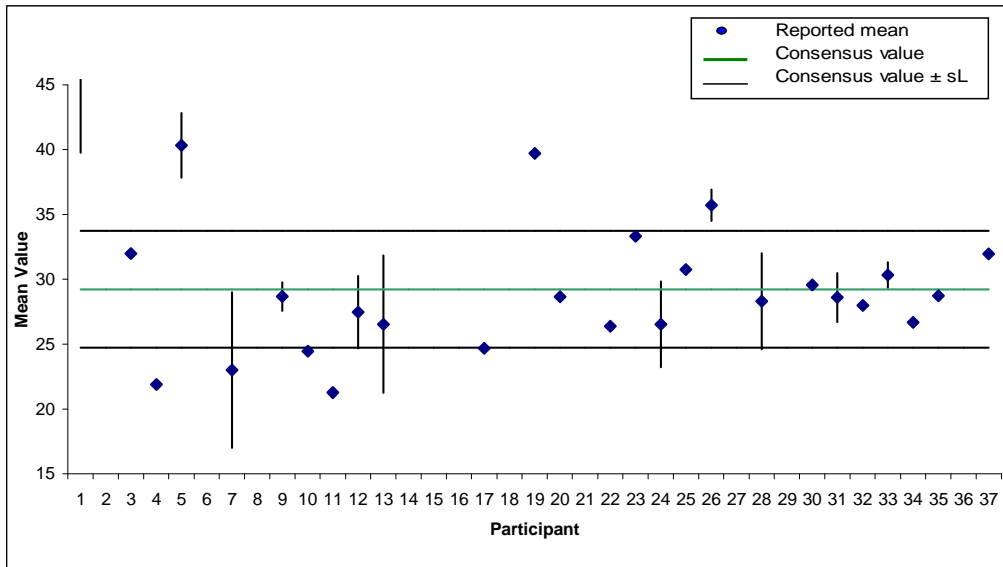
Graph 2
Values Reported by Participants - Sample A - Calcium



Out of Scale Participant

Lab	Mean value
1	1383,2
4	1287,0
5	1703,3
30	464,4

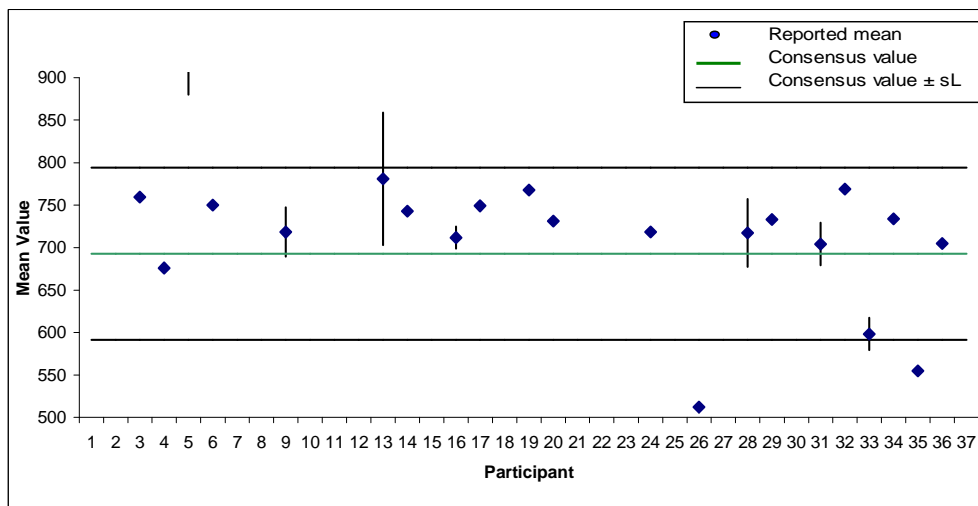
Graph 3
Values Reported by Participants - Sample A - Zinc



Out of Scale Participant

Lab	Mean value
1	48,4

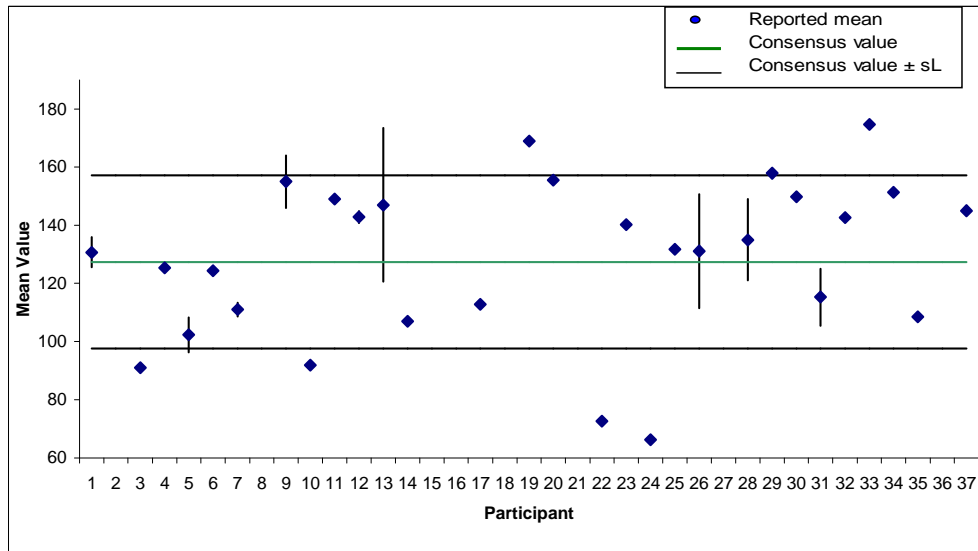
Graph 4
Values Reported by Participants - Sample A - Phosphorus



Out of Scale Participant

Lab	Mean value
5	926,0
7	305,7
12	199,3
30	278,9

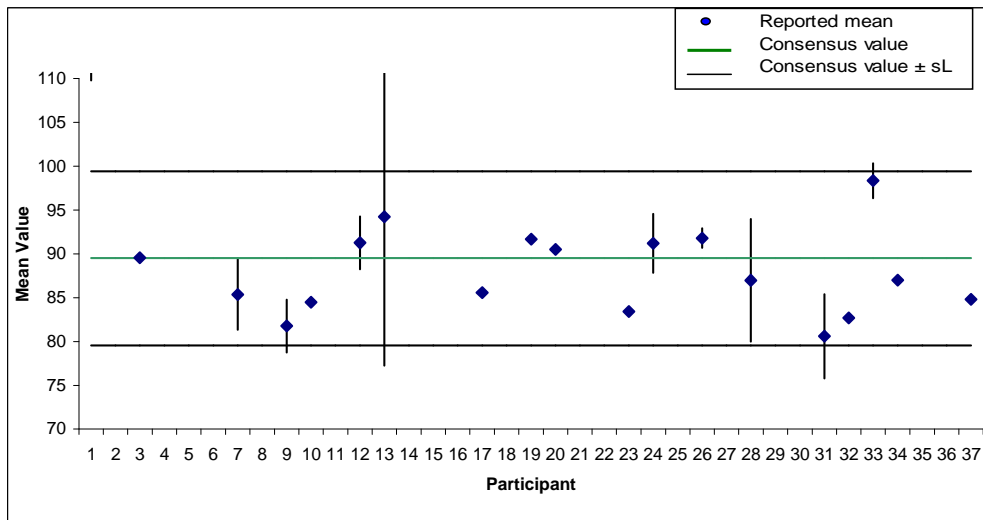
Graph 5
Values Reported by Participants - Sample A - Iron



Out of Scale Participant

Lab	Mean value
16	8,0

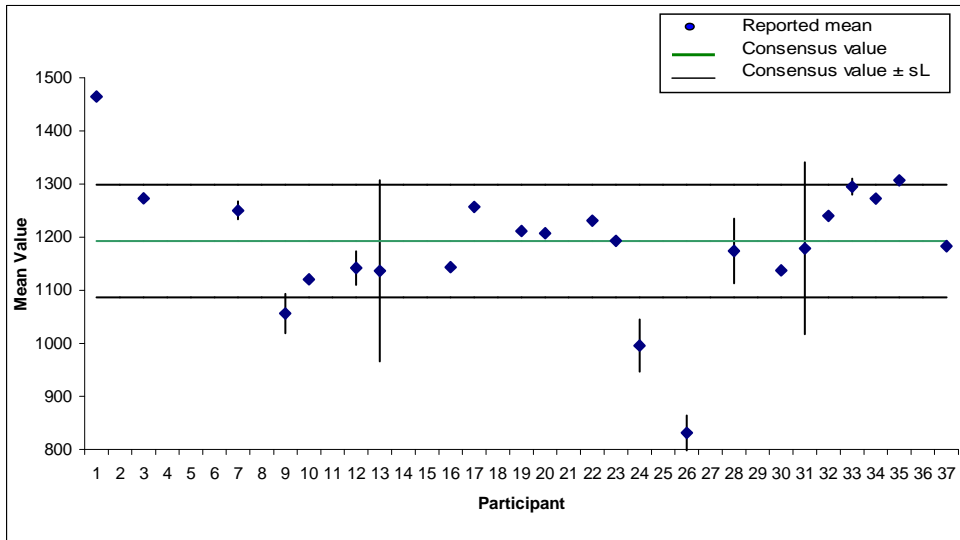
Graph 6
Values Reported by Participants - Sample A - Magnesium



Out of Scale Participant

Lab	Mean value	Lab	Mean value
1	119,1	16	114,0
4	150,8	30	43,8
5	122,0	35	33,8

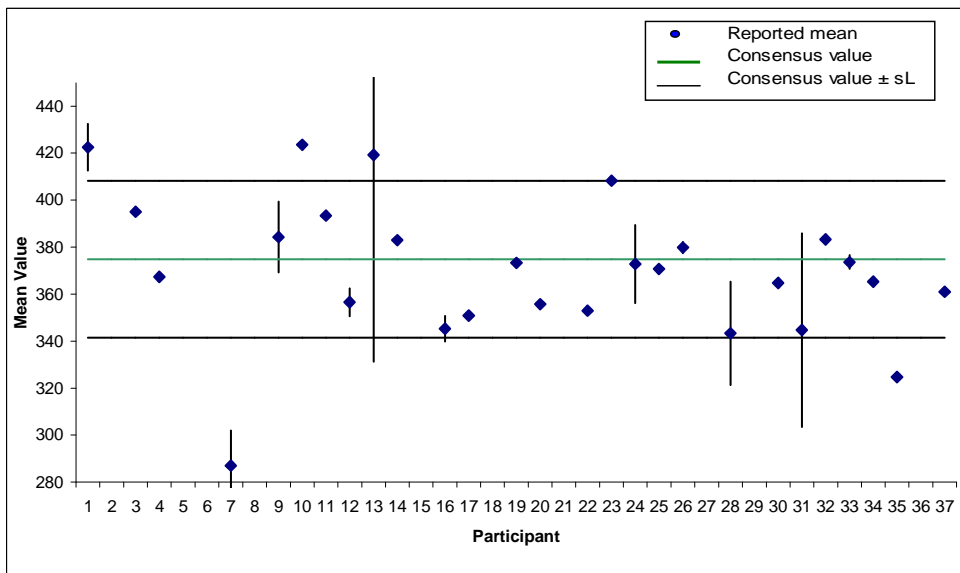
Graph 7
Values Reported by Participants - Sample A - Potassium



Out of Scale Participant

Lab	Mean value
25	745,6
5	1686,7

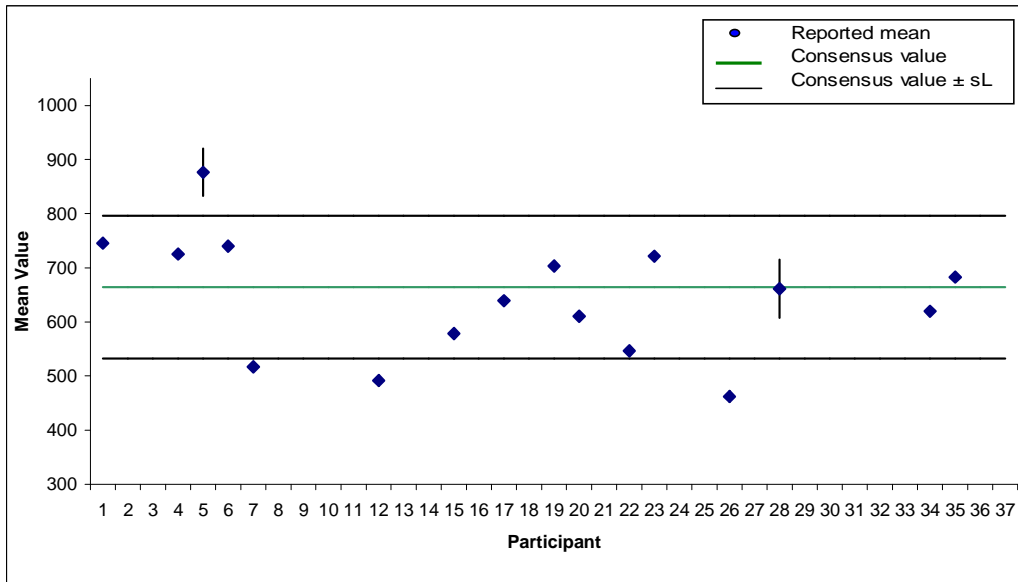
Graph 8
Values Reported by Participants - Sample A - Sodium



Out of Scale Participant

Lab	Mean value
5	490,0
36	946,0

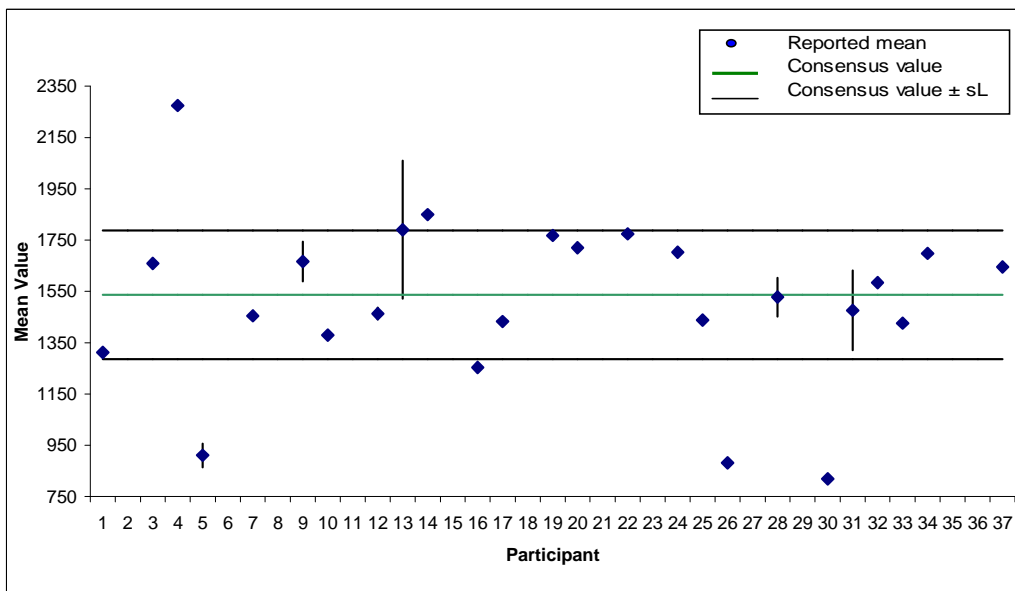
Graph 9
Values Reported by Participants - Sample B - Vitamin C



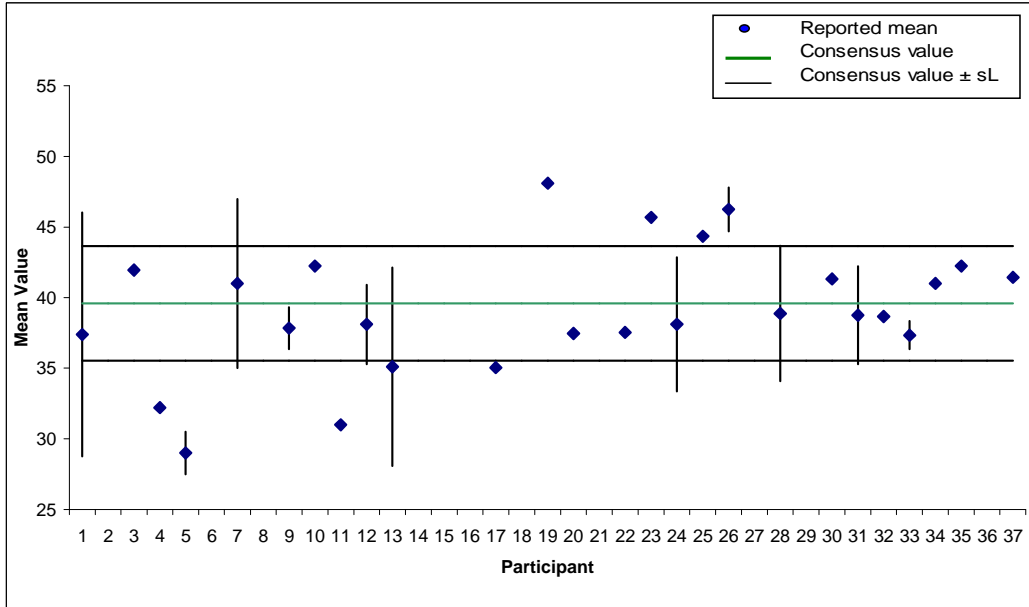
Out of Scale Participant

Lab	Mean value
32	1562,3

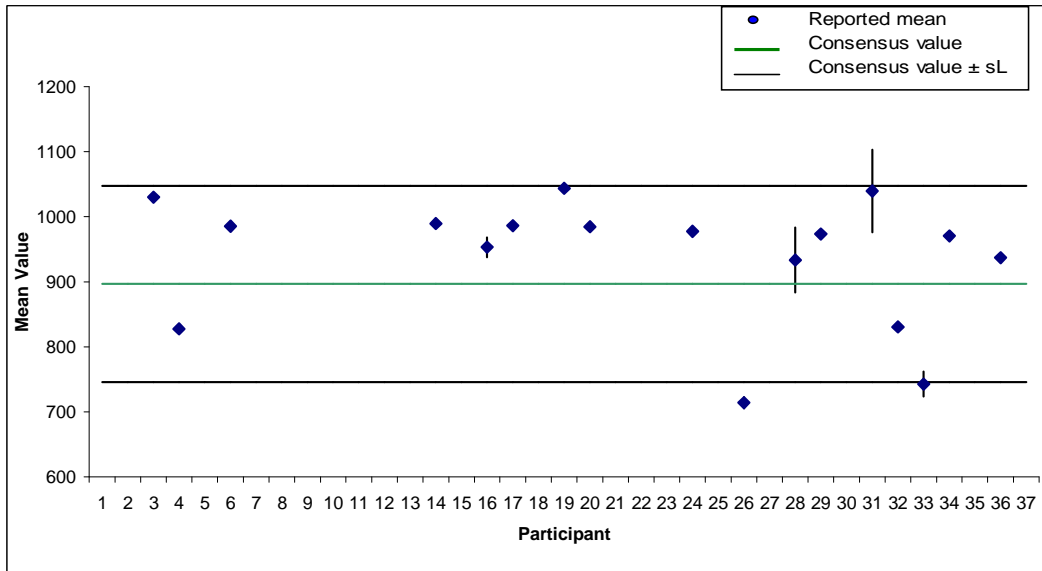
Graph 10
Values Reported by Participants - Sample B - Calcium



Graph 11
Values Reported by Participants - Sample B - Zinc



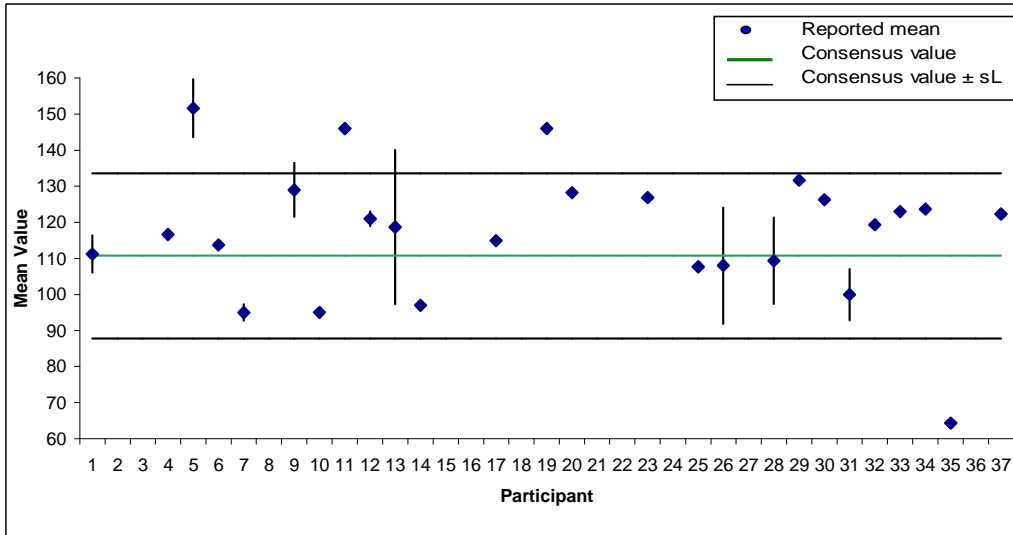
Graph 12
Values Reported by Participants - Sample B - Phosphorus



Out of Scale Participant

Lab	Mean value
7	509,7
30	348,3
35	526,3

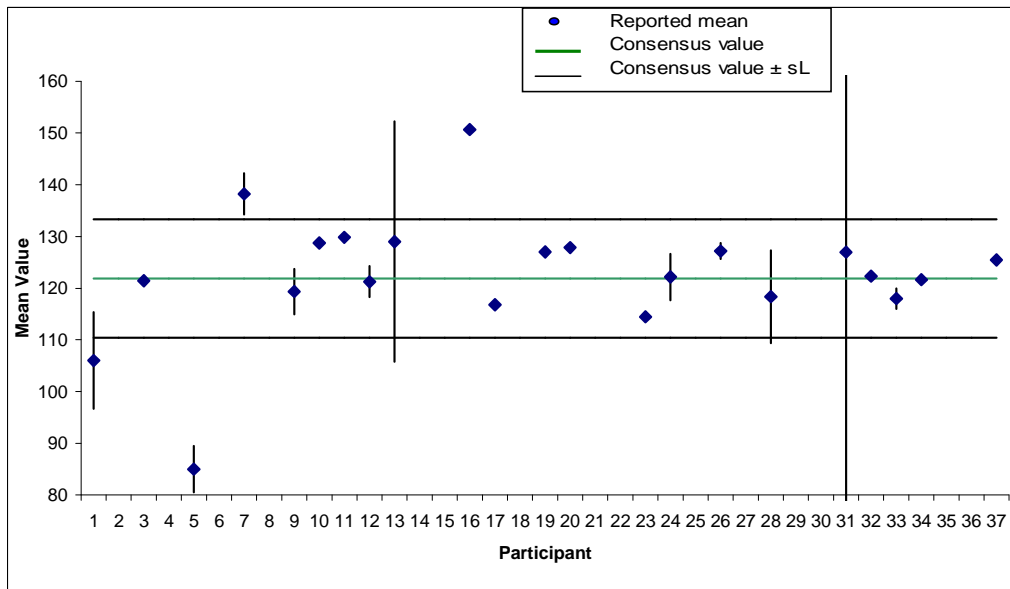
Graph 13
Values Reported by Participants - Sample B - Iron



Out of Scale Participant

Lab	Mean value
3	30,0
16	7,6
22	33,9
24	49,5

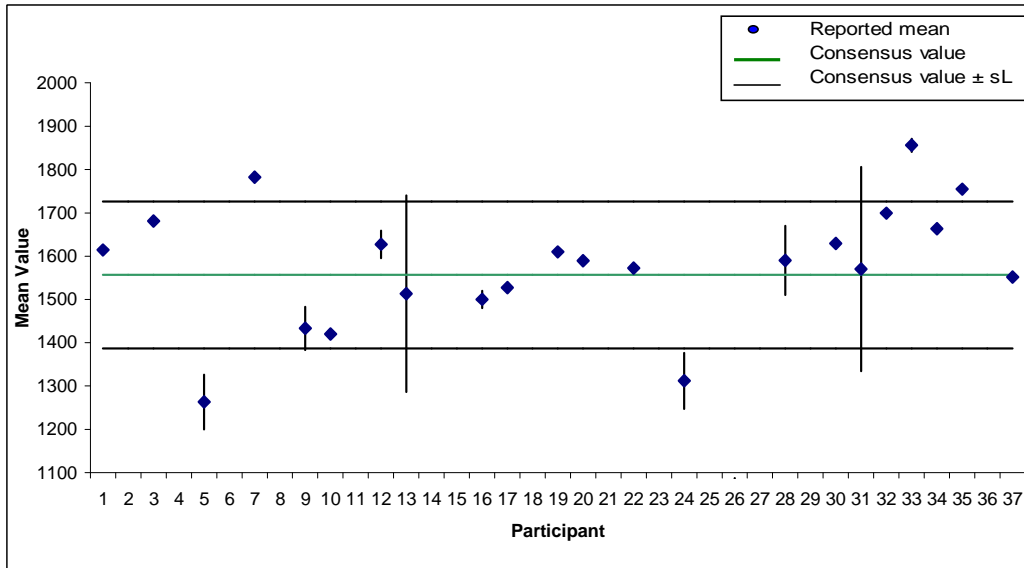
Graph 14
Values Reported by Participants - Sample B - Magnesium



Out of Scale Participant

Lab	Mean value
4	201,3
30	60,4
35	47,9

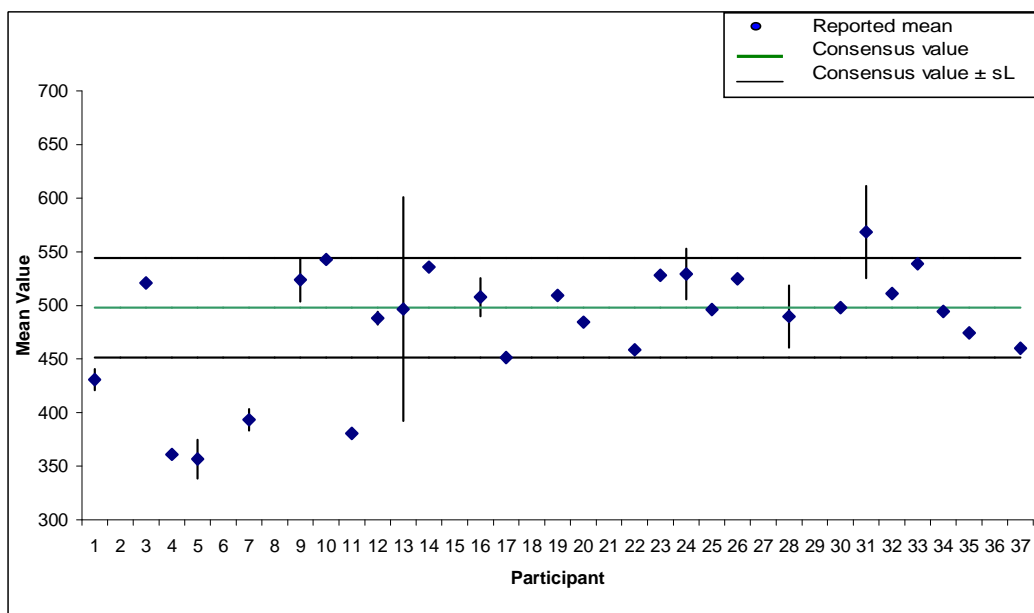
Graph 15
Values Reported by Participants - Sample B - Potassium



Out of Scale Participant

Lab	Mean value
25	762,2
26	1083,2

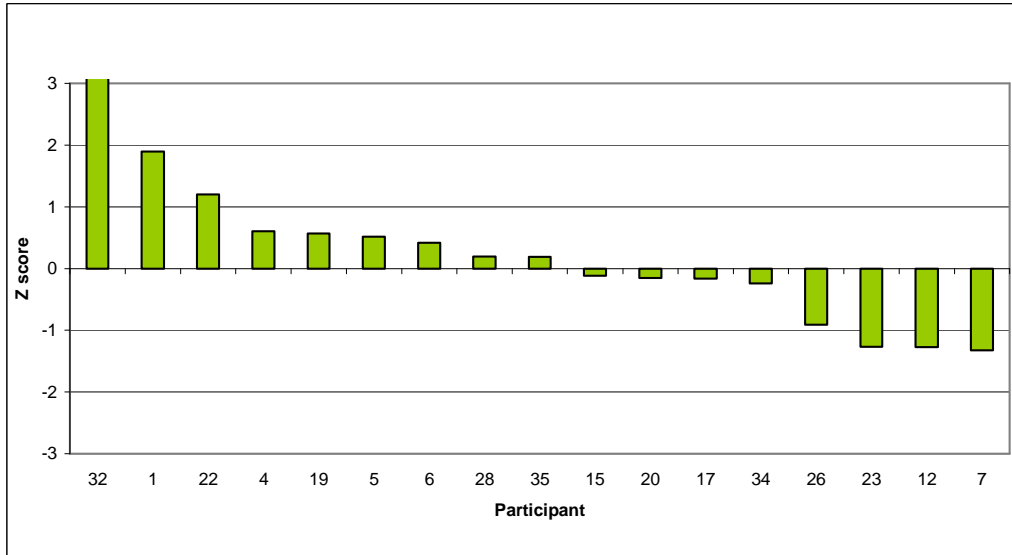
Graph 16
Values Reported by Participants - Sample B - Sodium



Out of Scale Participant

Lab	Mean value
36	1139,3

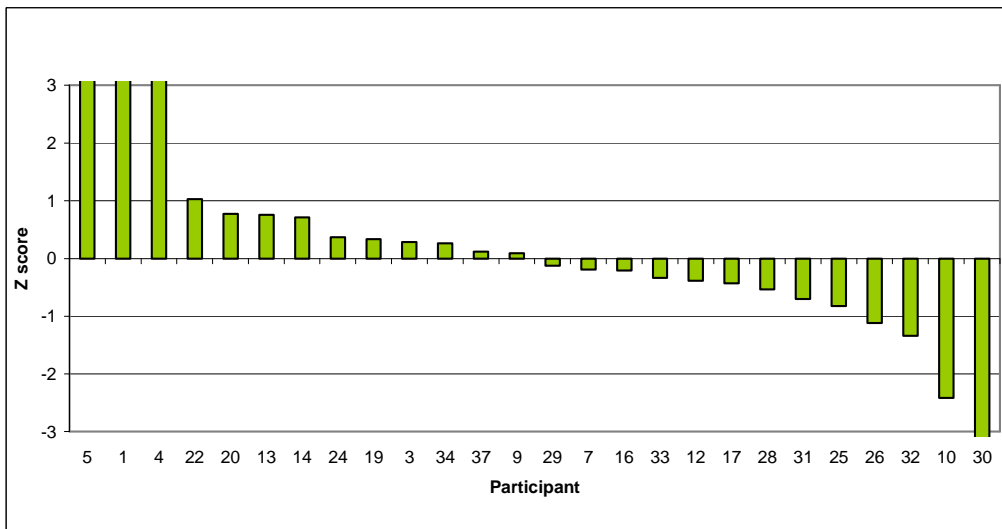
Graph 17
Z Score - Sample A - Vitamin C



Out of Scale Participant

Lab	z
32	7,6

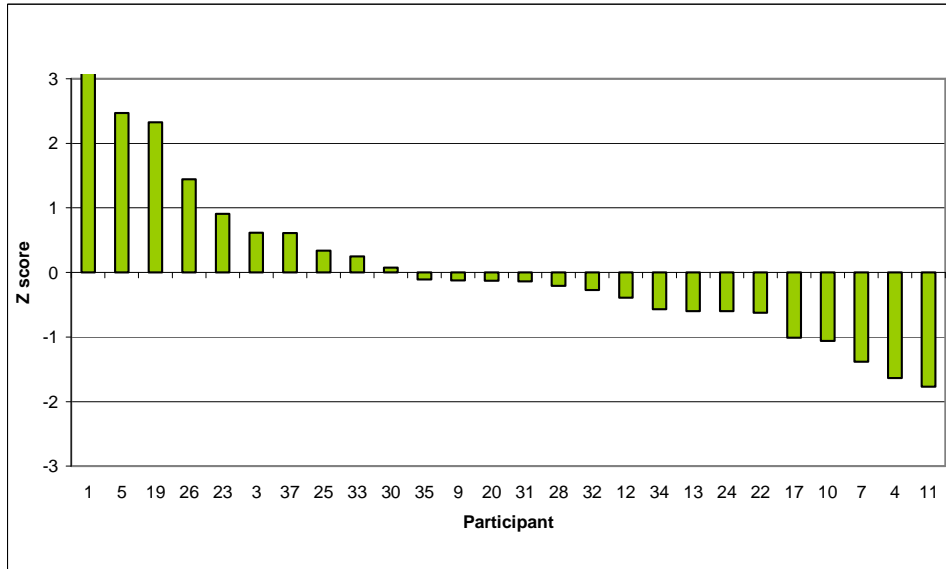
Graph 18
Z Score - Sample A - Calcium



Out of Scale Participant

Lab	z
5	7,4
1	4,5
4	3,6
30	-3,9

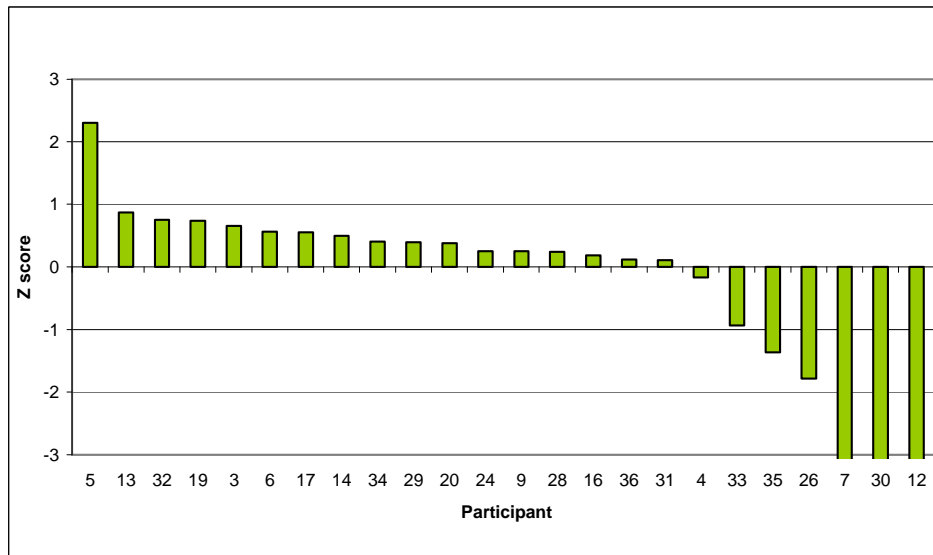
Graph 19
Z Score - Sample A - Zinc



Out of Scale Participant

Lab	z
1	4,3

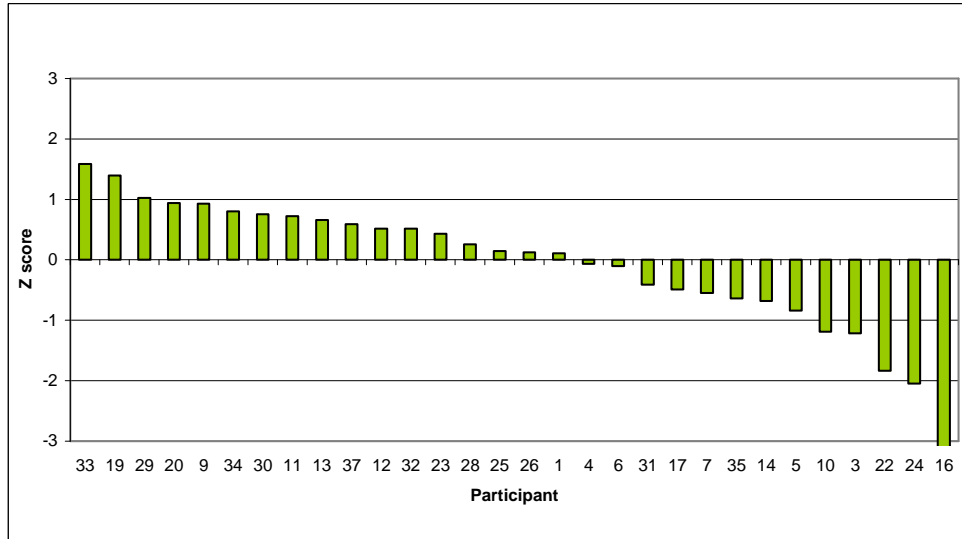
Graph 20
Z Score - Sample A - Phosphorus



Out of Scale Participant

Lab	z
7	-3,8
30	-4,1
12	-4,9

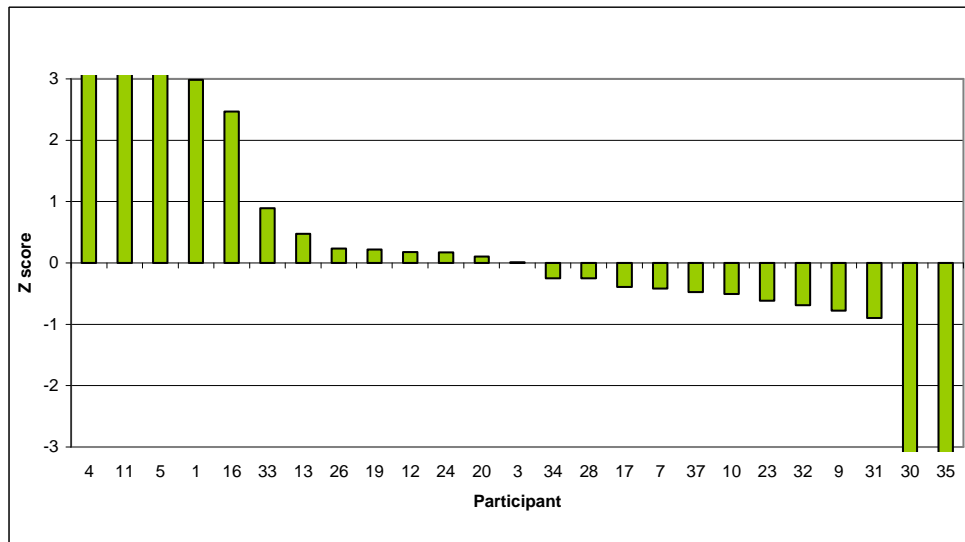
Graph 21
Z Score - Sample A - Iron



Out of Scale Participant

Lab	z
16	-4,0

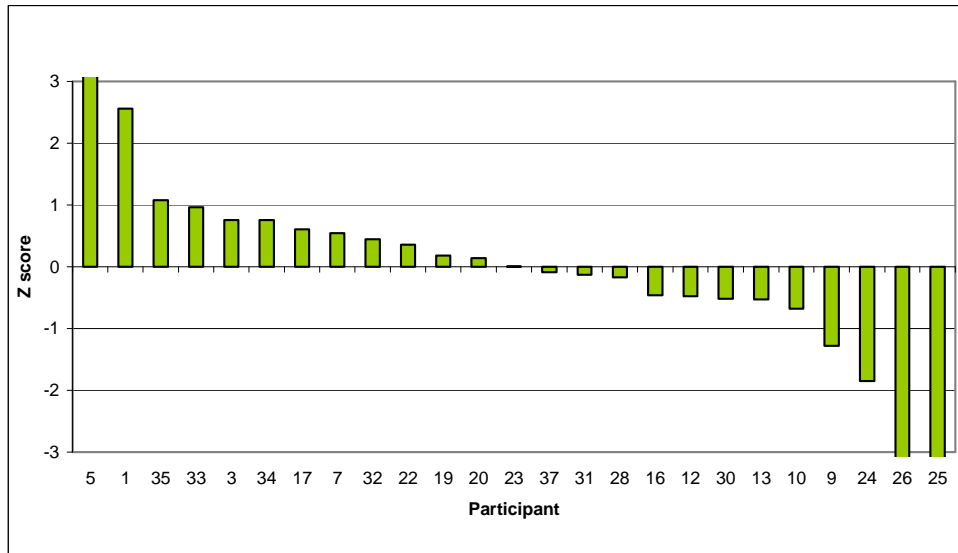
Graph 22
Z Score - Sample A - Magnesium



Out of Scale Participant

Lab	z
4	6,2
11	3,6
5	3,3
30	-4,6
35	-5,6

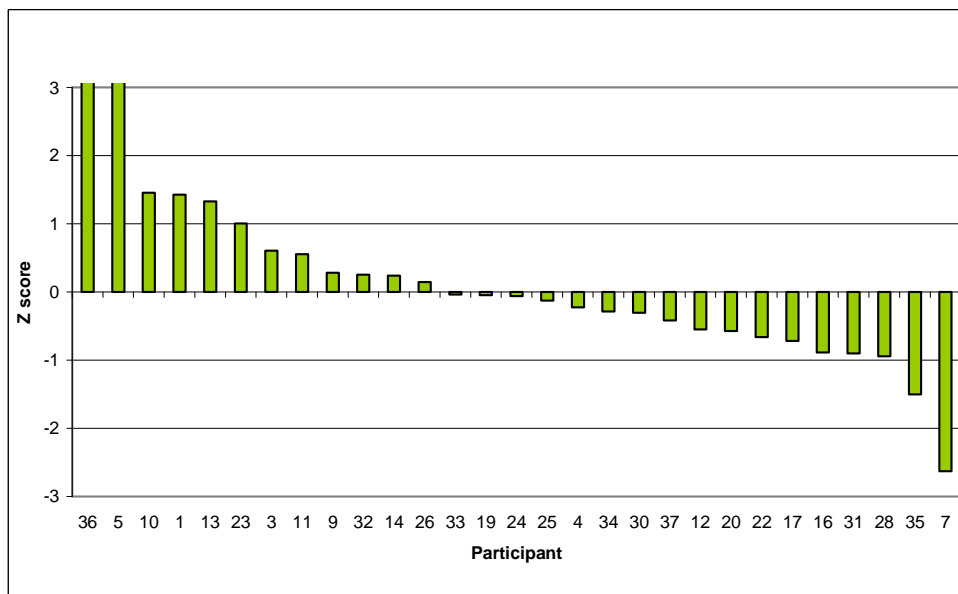
Graph 23
Z Score - Sample A - Potassium



Out of Scale Participant

Lab	z
5	4,6
26	-3,4
25	-4,2

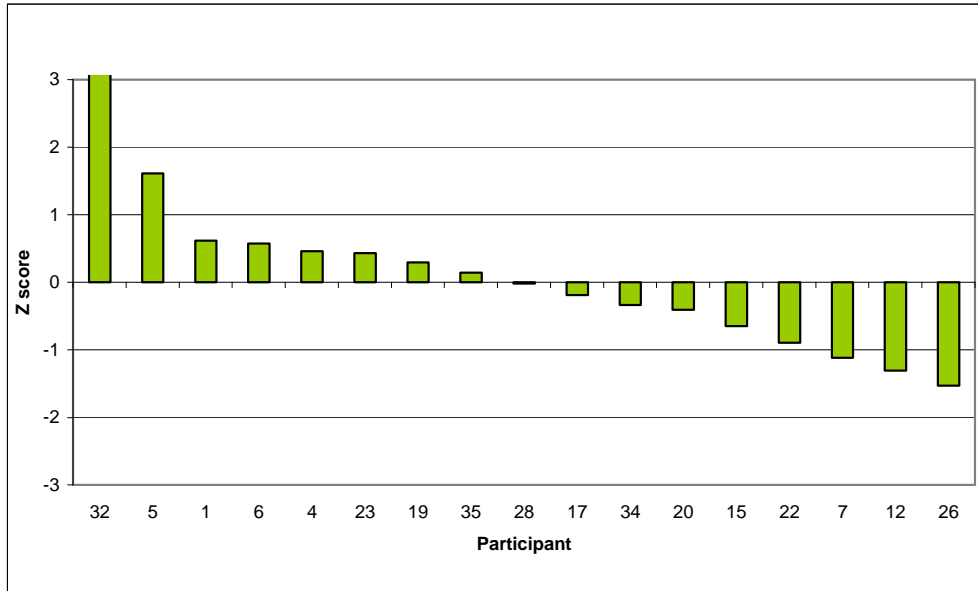
Graph 24
Z Score - Sample A - Sodium



Out of Scale Participant

Lab	z
36	17,1
5	3,4

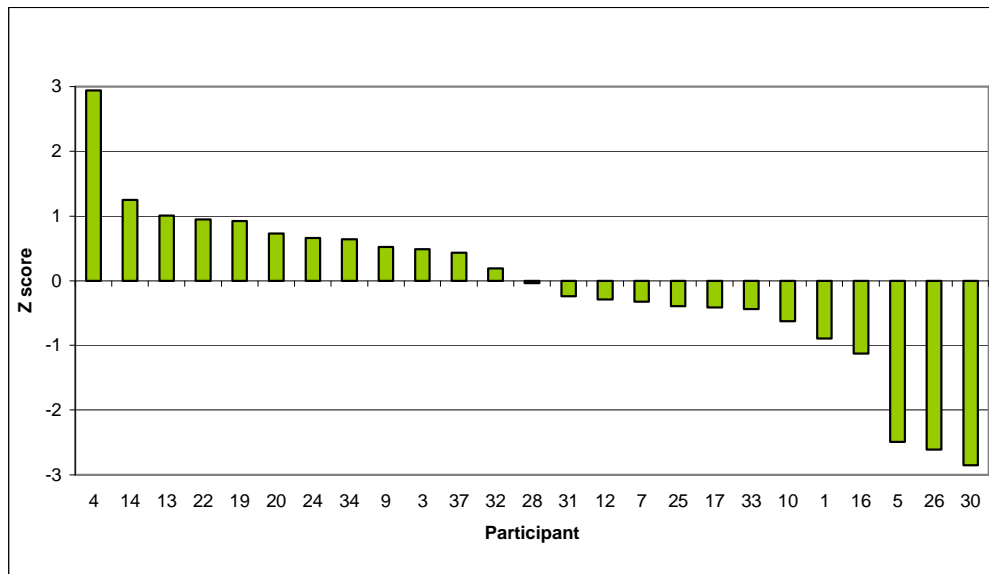
Graph 25
Z Score - Sample B - Vitamin C



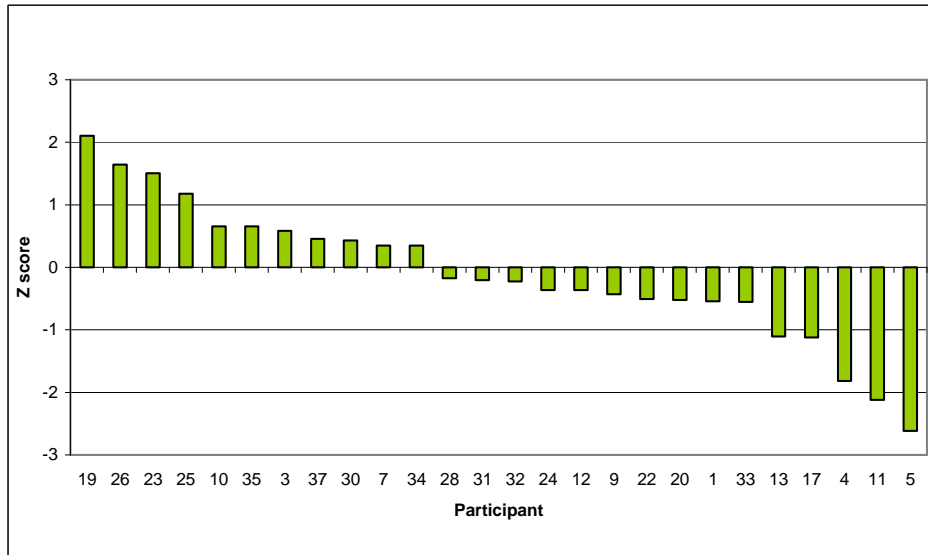
Out of Scale Participant

Lab	z
32	6,8

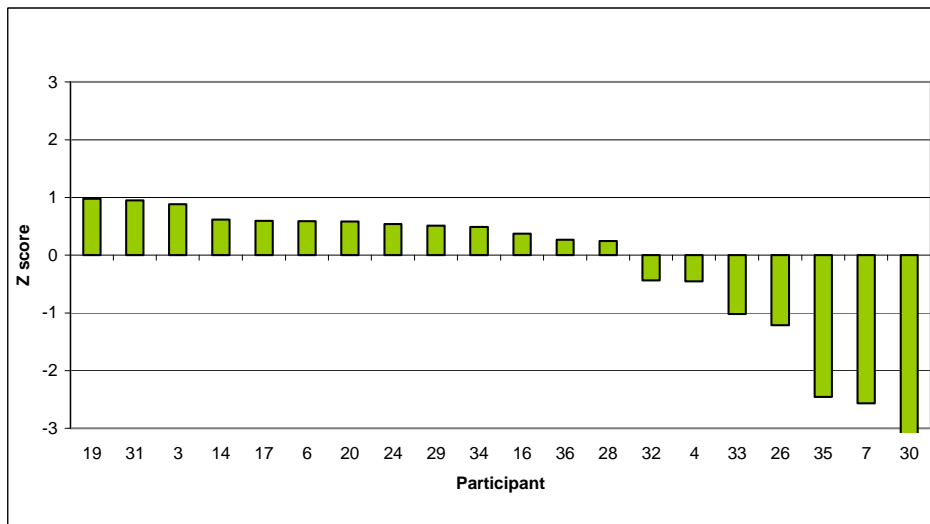
Graph 26
Z Score - Sample B - Calcium



Graph 27
Z Score - Sample B - Zinc



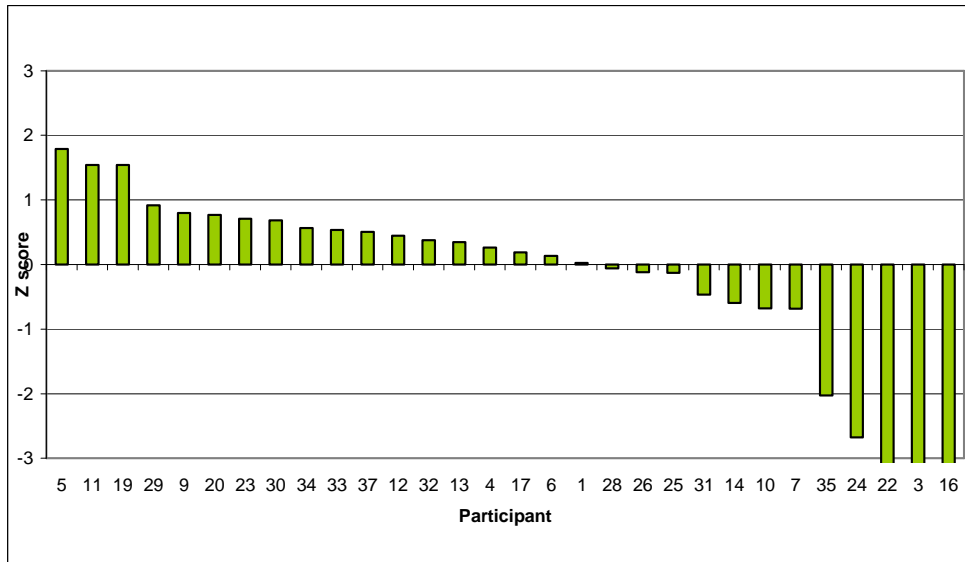
Graph 28
Z Score - Sample B - Phosphorus



Out of Scale Participant

Lab	z
30	-3,6

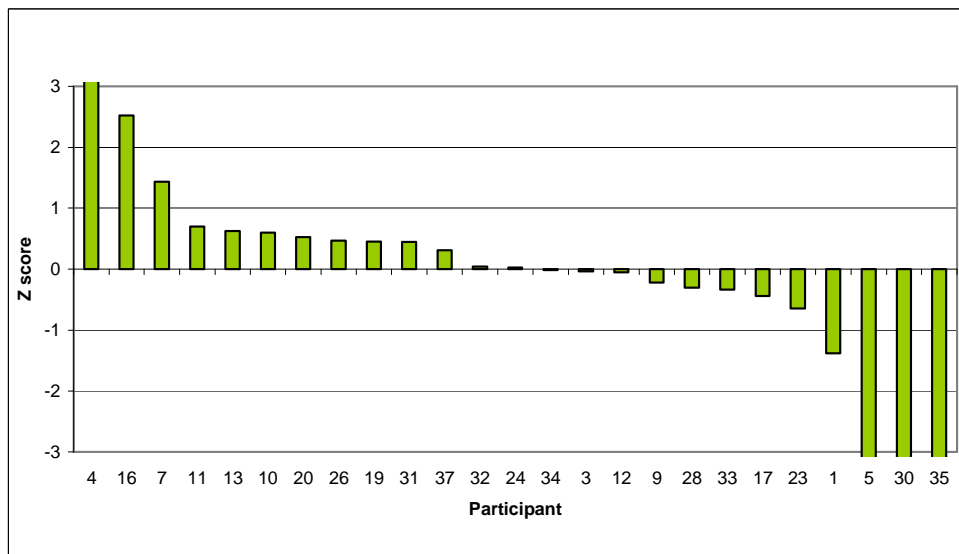
Graph 29
Z Score - Sample B - Iron



Out of Scale Participant

Lab	z
22	-3,4
3	-3,5
16	-4,5

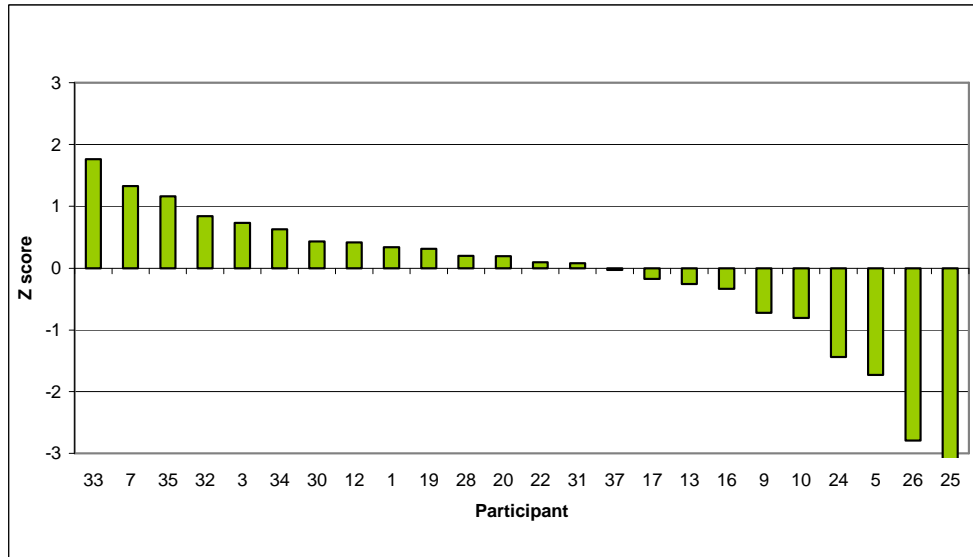
Graph 30
Z Score - Sample B - Magnesium



Out of Scale Participant

Lab	z
4	6,4
5	-3,2
30	-5,4
35	-6,5

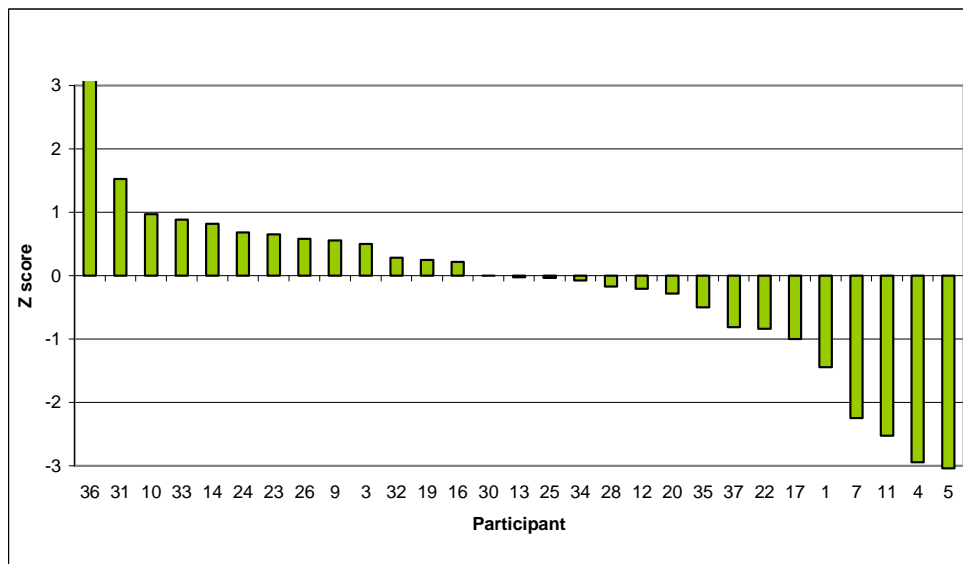
Graph 31
Z Score - Sample B - Potassium



Out of Scale Participant

Lab	z
25	-4,7

Graph 32
Z Score - Sample B - Sodium



Out of Scale Participant

Lab	z
36	13,8
5	-3,0

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