Supplemental material

Table S1: Faecal bacteria and SCFAs in children (2 -5 years) by gender at baseline.

	Male (n=67)	**Female (N=73)**	**Total (n=140)**
Total bacteria	10.24±0.46	10.35±0.31	10.29±0.39
Lactobacillus	9.75±1.40	9.94±1.14	9.85±1.27
Bifidobacterium	8.94±0.95	9.10±0.52	9.03±0.76
Acetic acid	73.44±27.31	75.01±23.53	74.24±25.36
Propionic acid	37.78±22.46	38.6±18.36	38.2±20.39
Butyric acid	24.76±15.41	22.98±11.98	23.84±13.71
Valeric acid	4.35±4.23	3.18±3.20	3.74±3.76
Isobutyric acid	1.46±1.68	1.29±1.09	1.38±1.41
2-methylbutyric acid	0.95±1.13	0.71±0.67	0.83±0.92
Isovaleric acid	1.51±1.51	1.33±0.93	1.42±1.24
Lactic acid	16.85±32.01	10.18±18.82	13.20±25.75

[1]Bacterial counts expressed as log10/gram of faecal sample.

[2]SCFA Values are mean given in mmol/kg wet weight faeces

Table S2: Lactobacilli, bifidobacteria and SCFA in relation to nutritional status of children (2-5 years) at baseline.

	Weight for Age			
	Normal N=89	Moderately Underweight N=36	Severely Underweight N=15	P-value
Total bacteria	10.28±0.38	10.32±0.42	10.42±0.34	0.19
Lactobacillus	9.79±1.30	9.93±1.22	10.57±0.79	0.03
Bifidobacterium	9.06±0.68	8.96±0.70	9.15±0.43	0.62
Acetic acid	75.96±24.5	71.7±27.0	70.51±23.89	0.43
Propionic acid	38.24±18.91	38.3±23.2	39.20±17.24	0.85
Butyric acid	24.54±13.88	22.36±13.26	20.80±8.13	0.38
Valeric acid	3.55±3.98	4.07±3.46	4.15±3.48	0.58
Isobutyric acid	1.25±1.49	1.57±1.24	1.55±1.19	0.46
2-methylbutyric acid	0.75±1.01	0.95±0.77	0.81±0.65	0.83
Isovaleric acid	1.30±1.35	1.57±1.07	1.48±0.91	0.62
Lactic acid	13.17±25.99	13.42±25.91	14.86±22.49	0.81

[1]Bacterial counts expressed as log10/gram of fecal sample.

[2]SCFA Values are mean given in mmol/kg wet weight faeces

WAZ: weight for age Z score. WAZ >-2 SD was considered Normal; WAZ ≤-2 to -3 was considered Moderately Underweight; WAZ <-3 SD was considered Severely Underweight

Table S3 After *L. paracasei* Lpc-37 supplementation. Correlation of short chain fatty acids and faecal bacteria in children at the beginning of the study; baseline. (N=51). Bold values indicate statistically significant correlations, after Bonferroni correction.

		tot bac	Lacto bacillus	L. paracasei	Bifido bacterium	B. lactis	Aceticacid	Propionicacid	Butyric acid	Valeric acid	Isobutyricacid	2methylbutyricacid	Isovalericacid	Lacticacid
Total bacteria	r	1.000	-.023	-.023	.277	.445	-.115	-.010	.173	.358	.569	.384	.586	-.116
	p	**0**	.873	.877	.049	**.001**	.435	.947	.238	.016	**.000**	.009	**.000**	.465
Lactobacillus	r	-.023	1.000	-.006	.282	.213	.219	.214	.251	.307	-.037	-.102	.036	-.014
	p	.873	**0**	.970	.045	.142	.136	.144	.085	.040	.807	.503	.815	.929
L. paracasei	r	-.023	-.006	1.000	.330	.120	-.066	-.143	-.096	.196	.002	-.059	-.020	.053
	p	.877	.970	**0**	.022	.423	.668	.349	.532	.213	.991	.712	.899	.742
Bifidobacterium	r	.277	.282	.330	1.000	.449	.015	-.015	.066	.082	.118	.103	.216	-.120
	p	.049	.045	.022	**0**	**.001**	.917	.918	.655	.592	.434	.501	.154	.448
B. lactis	r	.445	.213	.120	.449	1.000	-.087	-.010	.156	.156	.206	.185	.186	.043
	p	.001	.142	.423	.001	**0**	.562	.948	.295	.313	.176	.229	.226	.790
Aceticacid	r	-.115	.219	-.066	.015	-.087	1.000	.858	.738	.305	-.232	-.392	-.235	-.167
	p	.435	.136	.668	.917	.562	**0**	**.000**	**.000**	.039	.116	.007	.116	.284
Propionicacid	r	-.010	.214	-.143	-.015	-.010	.858	1.000	.696	.224	-.357	-.547	-.432	-.046
	p	.947	.144	.349	.918	.948	**.000**	**0**	**.000**	.135	.014	**.000**	**.003**	.768
Butyricacid	r	.173	.251	-.096	.066	.156	.738	.696	1.000	.342	.004	-.181	.001	-.140
	p	.238	.085	.532	.655	.295	**.000**	**.000**	**0**	.020	.981	.229	.993	.371
Valericacid	r	.358	.307	.196	.082	.156	.305	.224	.342	1.000	.471	.240	.290	-.045
	p	.016	.040	.213	.592	.313	.039	.135	.020	**0**	**.001**	.117	.053	.781
Isobutyricacid	r	.569	-.037	.002	.118	.206	-.232	-.357	.004	.471	1.000	.933	.826	-.284
	p	**.000**	.807	.991	.434	.176	.116	.014	.981	**.001**	**0**	**.000**	**.000**	.072
2methylbutyricacid	r	.384	-.102	-.059	.103	.185	-.392	-.547	-.181	.240	.933	1.000	.811	-.057
	p	.009	.503	.712	.501	.229	.007	**.000**	.229	.117	**.000**	**0**	**.000**	.728
Isovalericacid	r	.586	.036	-.020	.216	.186	-.235	-.432	.001	.290	.826	.811	1.000	-.299
	p	**.000**	.815	.899	.154	.226	.116	**.003**	.993	.053	**.000**	**.000**	**0**	.061

Lacticacid	r	-.116	-.014	.053	-.120	.043	-.167	-.046	-.140	-.045	-.284	-.057	-.299	1.000
	p	.465	.929	.742	.448	.790	.284	.768	.371	.781	.072	.728	.061	**0**

Table S4 After *B. lactis* HN019 supplementation. Correlation of short chain fatty acids and faecal bacteria in children at the beginning of the study; baseline. (N=44). Bold values indicate statistically significant correlations, after Bonferroni correction.

		tot bac	Lacto bacillus	L. paracasei	Bifidobacterium	B. lactis	Aceticacid	Propionicacid	Butyricacid	Valericacid	Isobutyricacid	2methylbutyricacid	Isovalericacid	Lacticacid
Total bacteria	r	1.000	.295	.467	.487	.320	-.348	-.131	.050	.657	.847	.782	.884	-.257
	p	**0**	.052	.021	**.001**	.034	**.028**	.421	.761	**.000**	**.000**	**.000**	**.000**	.148
Lactobacillus	r	.295	1.000	0.000	.497	.180	-.279	-.210	.005	.343	.445	.501	.500	.050
	p	.052	**0**	1.000	**.001**	.243	.081	.194	.978	.032	**.005**	**.002**	**.001**	.782
L. paracasei	r	.467	0.000	1.000	.348	.151	-.074	.191	-.027	.588	.311	-.085	.395	-.414
	p	.021	1.000	**0**	.096	.480	.758	.420	.910	.008	.196	.747	.094	.098
Bifidobacterium	r	.487	.497	.348	1.000	.239	-.096	-.141	.243	.331	.444	.299	.446	-.172
	p	**.001**	**.001**	.096	**0**	.119	.554	.386	.130	.040	.005	.077	**.004**	.339
B. lactis	r	.320	.180	.151	.239	1.000	-.118	-.082	.137	.287	.290	.153	.269	-.323
	p	.034	.243	.480	.119	**0**	.468	.617	.400	.077	.073	.373	.097	.067
Aceticacid	r	-.348	-.279	-.074	-.096	-.118	1.000	.708	.307	-.100	-.261	-.502	-.344	.174
	p	.028	.081	.758	.554	.468	**0**	**.000**	.051	.539	.103	**.002**	.030	.325
Propionicacid	r	-.131	-.210	.191	-.141	-.082	.708	1.000	.345	.072	-.163	-.369	-.127	.076
	p	.421	.194	.420	.386	.617	**.000**	**0**	.027	.660	.315	.024	.434	.671
Butyricacid	r	.050	.005	-.027	.243	.137	.307	.345	1.000	.118	-.053	-.229	.090	-.055
	p	.761	.978	.910	.130	.400	.051	.027	**0**	.469	.747	.172	.581	.759
Valericacid	r	.657	.343	.588	.331	.287	-.100	.072	.118	1.000	.698	.511	.645	-.348
	p	**.000**	.032	.008	.040	.077	.539	.660	.469	**0**	**.000**	**.001**	**.000**	.048
Isobutyricacid	r	.847	.445	.311	.444	.290	-.261	-.163	-.053	.698	1.000	.922	.897	-.35
	p	**.000**	.005	.196	.005	.073	.103	.315	.747	**.000**	**0**	**.000**	**.000**	.044

2methylbutyricacid	r	.782	.501	-.086	.299	.153	-.502	-.369	-.229	.511	.922	1.000	.883	-.162
	p	**.000**	**.002**	.747	.077	.373	**.002**	.024	.172	**.001**	**.000**	**0**	**.000**	.393
Isovalericacid	r	.884	.500	.395	.446	.269	-.344	-.127	.090	.645	.897	.883**	1.000	-.200
	p	**.000**	**.001**	.094	**.004**	.097	.030	.434	.581	**.000**	**.000**	**.000**	**0**	.265
Lacticacid	r	-.257	.050	-.414	-.172	-.323	.174	.076	**-.055**	**-.348**	**-.353**	**-.162**	**-.200**	**1.000**
	p	.148	.782	.098	.339	.067	.325	.671	.759	.048	.044	.393	.265	**0**

Table S5. After placebo supplementation. Correlation of short chain fatty acids and faecal bacteria in children at the beginning of the study; baseline. (N=44). Bold values indicate statistically significant correlations, after Bonferroni correction.

		tot bac	Lacto bacillus	L. paracasei	Bifidobacterium	B. lactis	Aceticacid	Propionicacid	Butyricacid	Valeric acid	Isobutyricacid	2methylbutyricacid	Isovalericacid	Lacticacid
Total bacteria	r	1.000	.131	.314	.500	.112	-.367	-.265	-.111	.662	.743	.753	.700	-.613
	p	**0**	.410	.127	**.001**	.480	.016	.086	.480	**.000**	**.000**	**.000**	**.000**	**.000**
Lactobacillus	r	.131	1.000	.159	.387	.147	-.325	-.290	-.010	.235	.155	.233	.040	-.128
	p	.410	**0**	.447	.011	.360	.038	.066	.950	.145	.346	.153	.802	.438
L. paracasei	r	.314	.159	1.000	.152	-.069	-.284	-.268	.041	.052	.324	.376	.503	-.440
	p	.127	.447	**0**	.467	.742	.178	.206	.850	.809	.131	.070	.012	.031
Bifidobacterium	r	.500	.387	.152	1.000	.147	-.321	-.406	-.138	.230	.181	.208	.223	-.444
	p	**.001**	.011	.467	**0**	.360	.036	**.007**	.378	.143	.258	.191	.151	**.004**
B. lactis	r	.112	.147	-.069	.147	1.000	-.180	-.382	-.198	.174	.257	.189	.134	.024
	p	.480	.360	.742	.360	**0**	.261	.014	.216	.282	.115	.249	.404	.887
Aceticacid	r	-.367	-.325	-.284	-.321	-.180	1.000	.761	.416	-.017	-.242	-.447	-.236	.245
	p	.016	.038	.178	.036	.261	**0**	**.000**	.006	.914	.128	**.003**	.127	.127
Propionicacid	r	-.265	-.290	-.268	-.406	**-.382**	.761	1.000	.521	-.017	-.293	-.421	-.223	.210
	p	.086	.066	.206	.007	**.014**	**.000**	**0**	**.000**	.914	.063	.006	.151	.194
Butyricacid	r	-.111	-.010	.041	-.138	-.198	.416	.521	1.000	.100	.029	-.045	-.062	-.027
	p	.480	.950	.850	.378	.216	.006	**.000**	**0**	.528	.858	.781	.694	.870

Valericacid	r	.662	.235	.052	.230	.174	-.017	-.017	.100	1.000	.771	.705	.556	-.232
	p	**.000**	.145	.809	.143	.282	.914	.914	.528	**0**	**.000**	**.000**	**.000**	.155
Isobutyricacid	r	.743	.155	.324	.181	.257	-.242	-.293	.029	.771	1.000	.948	.773	-.403
	p	**.000**	.346	.131	.258	.115	.128	.063	.858	**.000**	**0**	**.000**	**.000**	.012
2methylbutyricacid	r	.753	.233	.376	.208	.189	-.447	-.421	-.045	.705	.948	1.000	.817	-.431
	p	**.000**	.153	.070	.191	.249	**.003**	.006	.781	**.000**	**.000**	**0**	**.000**	.007
Isovalericacid	r	.700	.040	.503	.223	.134	-.236	-.223	-.062	.556	.773	.817	1.000	-.442
	p	**.000**	.802	.012	.151	.404	.127	.151	.694	**.000**	**.000**	**.000**	**0**	**.004**
Lacticacid	r	-.613	-.128	-.440	-.444	.024	.245	.210	-.027	-.232	-.403	-.431	-.442	1.000
	p	**.000**	.438	.031	**.004**	.887	.127	.194	.870	.155	.012	.007	**.004**	**0**

Spearman rank correlation was performed to study the relation between all variables such as fecal bacteria and short chain fatty acids.
r (rho) indicates correlations and p indicates significance at 95% CI.
Significances are indicated in bold. *Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).