Supplementary Materials

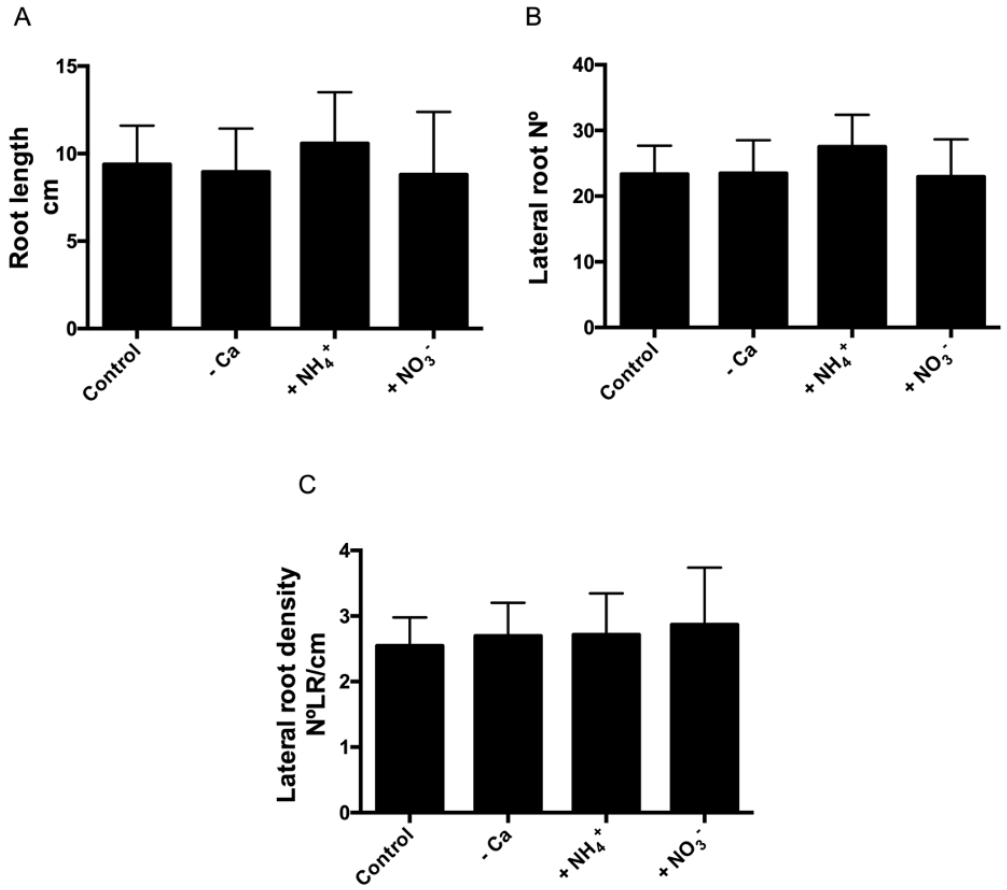

Figure S1. Root length and lateral root number are not altered in tomato seedlings under calcium deficit or ammonium and nitrate excesses. Tomato seedlings were grown with control media, with calcium deficit, or with ammonium or nitrate excesses for 10 days in a growth chamber as described in the Materials and Methods section. Tomato images were taken 10 days after sowing the seedlings: (**A**) main root length; (**B**) number of lateral roots; (**C**) lateral root density.

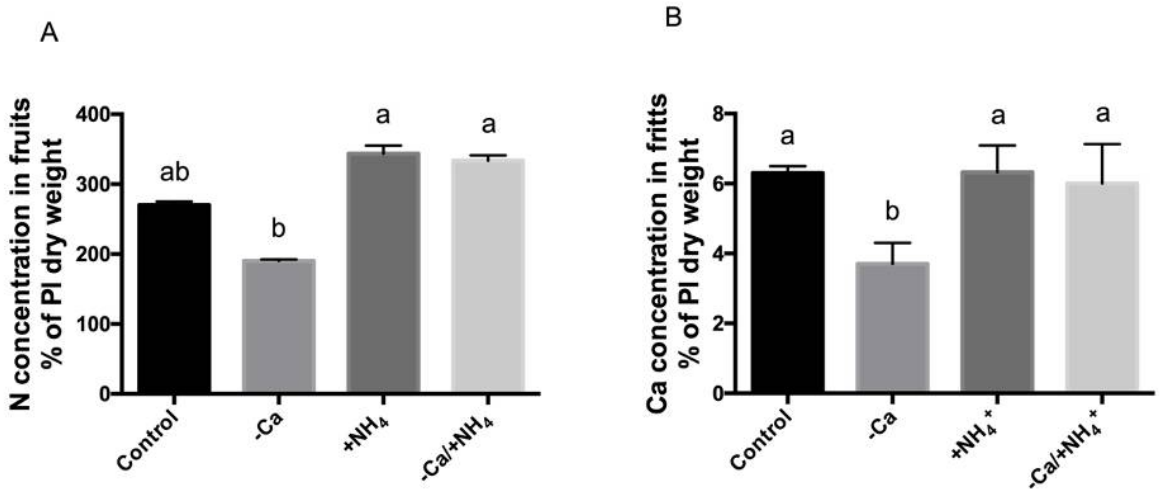

Figure S2. Nitrogen and calcium are altered by calcium deficit and not by ammonium and nitrate excesses in fruits. Tomato seedlings were grown with control media, with calcium deficit, or with ammonium or nitrate excesses for 10 days in a growth chamber as described in the Materials and Methods section. Tomato fruits were collected and dried at 45 °C in a dehydrator. Total nitrogen (**A**) and total calcium (**B**) were quantified as a percentage of plant dry weight. a, b represents statistically significant differences with $p < 0.05$.

Table S1. Media composition and nutricional content of *in-vitro* media.

	Control	**Calcium deficyt**	**Ammonium excess**	**Nitrate excess**
Component		**Concentration mg/L**		
Calcium Nitrate	328	33	-	479
Pottasium Nitrate	303	303	200	505
Sodium Nitrate		153	-	68
Ammonium phosphate	58	58	680	-
Calcium Cloride	-	-	222	-
Calcium phosphate	-	-	-	68
Magnesium phosphate	112	112	112	112
Micronutrients (Fetrilon Combi 2-C)	75	75	75	75
Sucrose	10	10	10	10
MES	500	500	500	500
Agar	8	8	8	8

Nutrient	Concentration [mmol/L]			
N	5.5	5.5	7.9	7.9
Ca	2	0.2	2	3.4
Mg	0.93	0.93	0.93	0.93
P	0.5	0.5	5.9	0.5
K	3	3	2	5
S	0.93	0.93	0.93	0.93
Na	-	1.8	-	-
Cl	-	-	2	-

Table S2. Media composition and nutricional content of *in-pot* media.

	MS macro- and micronutrients mg/L			
	Control	**Calcium deficyt**	**Ammonium excess**	**Calcium deficyt/Ammonium excess**
Calcium Chloride, Anhydrous	166.1	-	-	-
Ammonium Nitrate	825	-	-	-
Potassium Nitrate	950	1250	1250	1250
Ammonium Phosphate, Monobasic	-	150	150	150
Urea	-	-	1800	1800
Boric Acid	3.1	2.5	2.5	2.5
Cobalt Chloride•$6H_2O$	0.0125	0.05	0.05	0.05
Cupric Sulfate•$5H_2O$	0.0125	0.1	0.1	0.1
Na2EDTA•$2H_2O$	18.63	10	10	10
Ferrous Sulfate•$7H_2O$	13.9	7.5	7.5	7.5
Magnesium Sulfate, Anhydrous	90.35	97.7	97.7	97.7
Manganese Sulfate•H_2O	8.45	5	5	5
Molybdic Acid (Sodium Salt)•$2H_2O$	0.125	0.05	0.05	0.05
Potassium Iodide	0.415	0.5	0.5	0.5
Zinc Sulfate•$7H_2O$	4.3	0.5	0.5	0.5

Table S3. List of primers used.

Gene name	Primer Fw	Primer Rv
LeNRT1.1/LeNPF6.3	TCCCAGATGCTTGGGATTAC	CACCGCCTCAATCCCTAATA
LeNRT2.1	GTGGTAAGCGTGTTGGTTCC	ACGACTCAGCACATTGAACCT
LeNRT2.2	CGTGTCTGATCGGATTGATG	CCAGCGTATTGACAAGCAAC
LeNR	TTACAACTCCGTGCCATGAA	TCCATGTCTCTCCTCCATCC

Table S4. Nutritional data from in-vitro experiment used for PCA analysis.

Treatment	N (%)	P (%)	K (%)	Ca (%)	Mg (%)	N content ($mg*pl^{-1}$)	P content ($mg*pl^{-1}$)	K content ($mg*pl^{-1}$)	Ca content ($mg*pl^{-1}$)	Mg content ($mg*pl^{-1}$)	Cu content ($mg*pl^{-1}$)	Mn content ($mg*pl^{-1}$)	Zn content ($mg*pl^{-1}$)
Control in-vitro	6.15 c	0.86 b	5.39 ab	1.66 b	0.44 a	1.14 a	0.16 a	1.00 b	0.31 b	0.08 ab	0.0007 a	0.013 b	0.009 b
- Ca in-vitro	5.35 d	0.80 b	4.96 b	0.47 c	0.43 a	1.11 a	0.16 a	1.03 b	0.10 c	0.09 a	0.0008 a	0.017 a	0.013 a
+ NH_4^+ in-vitro	7.14 a	1.06 a	2.81 c	0.6 c	0.19 b	1.20 a	0.18 a	0.47 c	0.10 c	0.03 c	0.0005 b	0.002 d	0.005 c
+ NO_3^- in-vitro	6.81 b	0.47 c	5.69 a	1.94 a	0.4 a	1.27 a	0.09 b	1.27 a	0.36 a	0.08 b	0.0007 a	0.010 c	0.006 c

a, b, c, d represents statistically significant differences with $p < 0.05$.

Table S5. Nutritional data from potted plants used for PCA analysis.

Treatment	N (%)	P (%)	K (%)	Ca (%)	Mg (%)	N content ($mg*pl^{-1}$)	P content ($mg*pl^{-1}$)	K content ($mg*pl^{-1}$)	Ca content ($mg*pl^{-1}$)	Mg content ($mg*pl^{-1}$)	Cu content ($mg*pl^{-1}$)	Mn content ($mg*pl^{-1}$)	Zn content ($mg*pl^{-1}$)
Control pots	4.88 ab	0.29 c	3.75 b	2.42 a	1.16 a	1925.37 b	115.19 b	1479.71 ab	921.28 a	443.79 a	0.12 a	2.20 a	2.20 b
- Ca pots	3.31 b	0.55 a	5.93 a	1.15 b	0.57 b	600.54 c	97.66 b	1066.50 b	210.20 b	108.55 b	0.043 b	1.44 b	1.44 c
+ NH_4^+ pots	7.37 a	0.29 c	3.82 b	1.54 b	0.77 b	3252.93 a	129.05 ab	1684.56 ab	679.36 a	340.36 a	0.09 ab	2.99 a	2.99 a
+NH_4^+ x -Ca pots	6.37 a	0.46 b	3.97 b	1.51 b	0.77 b	2924.61 a	216.07 a	1825.99 a	704.71 a	362.17 a	0.065 b	1.82 a	1.82 b

a, b, c, d represents statistically significant differences with $p < 0.05$.

Table S6. Normalized nutritional and phenotypic data used for PCA analysis.

Treatment	N (% of pl dry weight)	P (% of pl dry weight)	K (% of pl dry weight)	Ca (% of pl dry weight)	Mg (% of pl dry weight)	N content (% relative to ctrl)	P content (% relative to ctrl)	K content (% relative to ctrl)	Ca content (% relative to ctrl)	Mg content (% relative to ctrl)	Cu content (% relative to ctrl)	Mn content (% relative to ctrl)	Zn content (% relative to ctrl)	Plant Dry weight (% relative to ctrl)	Shoot dry weight (% relative to ctrl)	Root Dry weight (% relative to ctrl)	N/K ratio	N/Ca ratio
Control in-vitro	6.1	0.9	5.4	1.7	0.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	1.1	3.7
- Ca in-vitro	5.3	0.8	5.0	0.5	0.4	97.0	103.0	102.7	31.6	108.9	103.0	125.1	145.3	116.0	114.1	122.0	1.1	11.4
+ NH_4^+ in-vitro	7.1	1.1	2.8	0.6	0.2	104.8	110.6	46.9	32.6	37.9	71.9	18.0	60.6	97.0	91.7	115.5	2.6	11.9
+ NO_3^- in-vitro	6.8	0.5	5.7	1.9	0.4	111.4	54.4	127.1	117.3	91.5	91.7	78.7	68.1	102.7	101.2	95.0	1.2	3.5
Control pots	4.9	0.3	3.7	2.4	1.2	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	1.3	2.1
- Ca pots	3.3	0.6	5.9	1.2	0.6	31.2	84.8	72.1	22.8	24.5	36.7	32.1	65.4	74.2	51.6	102.9	0.5	2.9
+ NH_4^+ pots	7.4	0.3	3.8	1.5	0.8	169.0	112.0	113.8	73.7	76.7	76.0	135.1	135.6	94.6	113.6	99.1	1.9	4.8
+ NH_4^+ x -Ca pots	6.4	0.5	4.0	1.5	0.8	151.9	187.6	123.4	76.5	81.6	55.6	110.1	82.6	99.2	110.1	177.0	1.6	4.3