

Additional file 1: Table S1. Characteristics of study participants and their medical and diet history. All values are median \pm median absolute deviation (MAD). p-values are either by Mann-Whitney U-test^a or Fisher Exact Probability test^b. n.s.: not-significant

	Children with ASD	Neurotypical children	P-value (two-tailed)
Total number	18	20	
Male/Female	16/2	18/2	
Age	10.8 \pm 1.6	11.4 \pm 2.5	n.s. ^a
Body mass index (BMI)	18.2 \pm 2.2	17.1 \pm 1.1	n.s. ^a
GSRs 4-point scale (sum of all 15 items, minimum score for no symptoms is 15)	28.0 \pm 3.3	18.8 \pm 3.0	P<0.001 ^a
Born by C-Section ¹	61%	15%	P<0.01 ^b
Number of months of breastfeeding exclusively (no formula)	3.0 \pm 2.8	8.8 \pm 6.7	P<0.05 ^a
% using non-standard formula (soy or other) ²	39%	5%	P<0.05 ^b
Food allergy (moderate or severe)	56%	5%	P<0.001 ^b
Other allergies (moderate or severe)	44%	10%	P=0.25 ^b
Eczema	56%	5%	P<0.001 ^b
Fiber consumption (grams) - child	9.4 \pm 4.2	11.0 \pm 2.5	P=0.15 ^{a,c}
Fiber consumption (grams) - mother ³	6.2 \pm 1.3	8.6 \pm 1.3	P<0.01 ^a
Carbohydrate consumption (grams) - child	108.9 \pm 37.8	126.3 \pm 30.9	P=0.51 ^a
Fat consumption (grams) - child	48.5 \pm 10.6	45.0 \pm 11.8	P=0.45 ^a
Protein consumption (grams) - child	52.4 \pm 17.5	47.9 \pm 7.9	P=0.75 ^a
Total calorie consumption (kcal) - child	1,135.3 \pm 316.4	1,014.9 \pm 160.9	P=0.89 ^a
Oral antibiotic use during first 4 years of life (number of rounds)	2.5 \pm 3.6	1.0 \pm 3.7	n.s. ^a

^a P values are from two-tailed Mann-Whitney U-test.

^bThe binary dataset was tested by two-tailed Fisher Exact Probability test.

^cOne-tailed Mann-Whitney U-test P value was 0.07.

¹1 mother of neurotypical children did not report the information.

²Mothers of 7 neurotypical children did not use any formula.

³Mother with **Children with ASD** (n=12); mothers with neurotypical children (n=13)

Additional file 1: Table S2. Percent days of no stool, stool hardness and softness based on the daily stool record (DSR) and the Bristol Stool Form Scale (P-values by two-tailed Wilcoxon signed-rank test)

				P-value (Baseline vs.)	
	Base line	Treatment end	8 weeks after treatment	Treatment end	8 weeks after treatment
No stool	33%	26%	26%	0.29	0.29
Hard stool (type 1 or 2)	19%	6%	3%	0.07	0.002
Soft/liquid stool (type 6 or 7)	10%	2%	3%	0.03	0.09
Abnormal stool (in total of hard, soft/liquid/ and no stool)	62%	34%	32%	0.002	0.002

Additional file 1: Table S3. Adverse effects.

Adverse effect	% adverse effects
Rash	5% (due to natural orange flavor in vancomycin)
Hyperactivity	39%* (temporary: start of vancomycin only)
Tantrums/aggression	28%* (temporary: start of vancomycin only)
Nausea/vomiting	5% (due to high-dose SHGM)

* The severity of symptoms ranged from mild to moderate.