

Actazin® green kiwifruit powder consumption at 600 mg per day for 28 days improves stool form and relieves occasional constipation in healthy individuals: a randomized controlled trial.

Supplementary Tables

Supplementary Table S1. Change in Patient Assessment of Constipation Symptoms Questionnaire (PAC-SYM) score at baseline and at day 28 for participants in the ITT population (n = 85).

Parameter	Study Day	Actazin Mean ± SD (n)** Median (Min - Max)	Placebo Mean ± SD (n)** Median (Min - Max)	Placebo Between Group P-Value*
Abdominal Symptoms	Baseline	1.35 ± 0.73 (44) 1.38 (0.00 to 3.00)	1.24 ± 0.61 (41) 1.25 (0.00 to 3.00)	0.476
	Day 28	0.63 ± 0.45 (43) 0.75 (0.00 to 1.75)	0.65 ± 0.57 (40) 0.50 (0.00 to 2.00)	0.845
	Change from Screening to Day 28	-0.72 ± 0.64 (43) -0.75 (-2.00 to 0.50) <0.001	-0.61 ± 0.68 (40) -0.50 (-3.00 to 0.75) <0.001	
	Baseline	0.76 ± 0.76 (44) 0.67 (0.00 to 3.33)	0.48 ± 0.65 (41) 0.00 (0.00 to 2.00)	0.372
	Day 28	0.25 ± 0.31 (43) 0.00 (0.00 to 1.00)	0.29 ± 0.52 (40) 0.00 (0.00 to 2.00)	0.215
	Change from Screening to Day 28	-0.50 ± 0.72 (43) -0.33 (-3.33 to 0.33) <0.001 (r)	-0.20 ± 0.69 (40) 0.00 (-2.00 to 1.50) 0.088 (r)	
Stool Symptoms	Baseline	1.96 ± 0.96 (44) 1.90 (0.00 to 4.00)	1.74 ± 0.70 (41) 1.80 (0.00 to 3.00)	0.243
	Day 28	0.98 ± 0.73 (43) 0.80 (0.00 to 2.60)	1.04 ± 0.63 (40) 1.00 (0.00 to 2.40)	0.652
	Change from Screening to Day 28	-0.97 ± 0.86 (43) -0.80 (-3.40 to 0.60) <0.001	-0.72 ± 0.81 (40) -0.60 (-2.40 to 0.80) <0.001	
	Baseline	1.45 ± 0.73 (44) 1.42 (0.17 to 3.08)	1.33 ± 0.52 (41) 1.36 (0.45 to 2.55)	0.249
	Day 28	0.68 ± 0.44 (43) 0.58 (0.00 to 1.75)	0.76 ± 0.49 (40) 0.64 (0.00 to 2.00)	0.524
	Change from Screening to Day 28	-0.77 ± 0.64 (43) -0.75 (-2.58 to 0.33) <0.001	-0.58 ± 0.61 (40) -0.45 (-2.45 to 0.55) <0.001	
PAC-SYM Overall				

n, number; SD, standard deviation; Min, minimum; Max, maximum.

* P-values were generated using ANOVA. P-values for change from screening/baseline generated using ANCOVA

** One participant from each group terminated the study early. One participant from the Actazin group did not complete this diary at day 28.

(r) indicates values were ranked prior to generating ANOVA/ANCOVA

Supplementary Table S2. Change in Patient Assessment of Constipation Quality of Life Questionnaire (PAC-QoL) score at baseline and at day 28 for participants in the ITT population (n = 85).

Parameter	Study Time	Actazin Mean ± SD (n**) Median (Min - Max)	Placebo Mean ± SD (n**) Median (Min - Max)	Placebo Between Group P-Value*
Physical Discomfort	Baseline	1.39 ± 0.75 (43) 1.50 (0.00 to 4.00)	1.60 ± 0.73 (41) 1.50 (0.25 to 4.00)	0.568
	Day 28	0.86 ± 0.61 (43) 0.75 (0.00 to 2.00)	0.80 ± 0.59 (40) 0.75 (0.00 to 2.33)	0.781
	Change from Screening to Day 28	-0.55 ± 0.85 (42) -0.62 (-3.25 to 0.75) <0.001 (r)	-0.81 ± 0.88 (40) -0.58 (-3.50 to 0.75) <0.001 (r)	0.434
Psychosocial Discomfort	Baseline	0.93 ± 0.93 (44) 0.67 (0.00 to 3.50)	0.67 ± 0.53 (41) 0.62 (0.00 to 1.88)	0.134
	Day 28	0.43 ± 0.47 (43) 0.25 (0.00 to 1.80)	0.38 ± 0.46 (40) 0.12 (0.00 to 1.62)	0.933
	Change from Screening to Day 28	-0.50 ± 0.77 (43) -0.30 (-2.58 to 1.00) <0.001 (r)	-0.31 ± 0.56 (40) -0.12 (-1.88 to 1.07) 0.001	0.133
Worries/Concerns †	Baseline	1.42 ± 0.91 (44) 1.29 (0.00 to 3.75)	1.26 ± 0.64 (41) 1.40 (0.14 to 2.29)	0.336
	Day 28	0.59 ± 0.48 (43) 0.55 (0.00 to 1.67)	0.72 ± 0.57 (40) 0.52 (0.00 to 2.09)	0.310
	Change from Screening to Day 28	-0.84 ± 0.89 (43) -0.66 (-3.57 to 0.92) <0.001	-0.56 ± 0.70 (40) -0.41 (-1.88 to 0.48) <0.001	0.125
Satisfaction †	Baseline	3.23 ± 0.74 (44) 3.25 (1.00 to 4.00)	3.22 ± 0.61 (41) 3.40 (1.60 to 4.00)	0.904
	Day 28	1.81 ± 1.28 (43) 2.00 (0.00 to 4.00)	2.00 ± 1.41 (40) 2.20 (0.00 to 4.00)	0.665
	Change from Screening to Day 28	-1.44 ± 1.49 (43) -1.25 (-4.00 to 1.00) <0.001	-1.22 ± 1.37 (40) -0.60 (-3.80 to 0.60) <0.001 (r)	0.690
PAC-QOL Overall †	Baseline	1.60 ± 0.82 (44) 1.43 (0.21 to 3.64)	1.47 ± 0.49 (41) 1.48 (0.56 to 2.23)	0.427
	Day 28	0.79 ± 0.51 (43) 0.68 (0.00 to 1.88)	0.85 ± 0.59 (40) 0.92 (0.00 to 1.91)	0.638
	Change from Screening to Day 28	-0.81 ± 0.85 (43) -0.63 (-3.29 to 0.59) <0.001	-0.63 ± 0.66 (40) -0.50 (-2.14 to 0.32) <0.001	

n, number; SD, standard deviation; Min, minimum; Max, maximum.

* p-values were generated using a logistic model with study group*time and site as fixed effects

** One participant from each group terminated the study early. One participant from the Actazin group did not complete this diary at day 28.

Supplementary table S3. Fecal bacterial taxa that were significantly different by pairwise Wilcoxon t-test between baseline and day 28 in the Actazin intervention group. P values shown. Asterisk in the rightmost column denotes significantly responding taxa in both comparison of Actazin at baseline vs. day 28 (this table) and Actazin vs. placebo at day 28s (Supplementary table S4), and these taxa are presented in Figure 3.

Phylum	Class	Order	Family	Genus	Species	p value
Actinobacteria	Coriobacteriia	Coriobacteriales	Eggerthellaceae			0.055
				<i>Adlercreutzia</i>		0.016 *
Bacteroidetes	Bacteroidia	Bacteroidales	Rikenellaceae	<i>Alistipes</i>	<i>indistinctus</i>	0.048 *
	Unclassified					0.040
Firmicutes	Clostridia	Clostridiales	Defluviitaleaceae	<i>Defluviitaleaceae</i>		0.029 *
			Lachnospiraceae	<i>Blautia</i>	<i>massiliensis</i>	0.004 *
				<i>Marvinbryantia</i>		0.039
			Peptococcaceae			0.046 *
				<i>Intestinibacter</i>	<i>bartlettii</i>	0.004 *
			Ruminococcaceae			0.033
				<i>Faecalibacterium</i>	<i>CM04.06</i>	0.016 *
				<i>Ruminococcaceae</i>		0.001
Proteobacteria	Erysipelotrichia	Erysipelotrichales	Erysipelotrichaceae	<i>Holdemanella</i>		0.031 *
	Gamma proteobacteria	Betaproteobacteriales	Burkholderiaceae	<i>Parasutterella</i>	<i>excrementihominis</i>	0.002

Supplementary table S4. Fecal bacterial taxa that were significantly different by pairwise Wilcoxon t-test between the Actazin intervention group and Placebo at Day 28. Asterisk in rightmost column denotes significantly responding taxa in both comparison of Actazin vs. placebo at day 28s (this table) and also Actazin at baseline vs. day 28 (Supplementary table S3), and are those presented in Figure 3.

Phylum	Class	Order	Family	Genus	Species	p value
Actinobacteria	Actinobacteria	Bifidobacteriales	Bifidobacteriaceae	<i>Bifidobacterium</i>		0.009
	Coriobacteriia	Coriobacteriales	Eggerthellaceae	<i>Adlercreutzia</i>	<i>bifidum</i>	0.029
Bacteroidetes	Bacteroidia	Bacteroidales	Bacteroidaceae	<i>Bacteroides</i>	<i>ovatus</i>	0.000
					<i>plebeius</i>	0.000
					<i>caccae</i>	0.001
			Bacteroidaceae	<i>Bacteroides</i>	<i>nordii</i>	0.002
					<i>massiliensis</i>	0.004 *
					<i>eggerthii</i>	0.016
			Muribaculaceae			0.000
			Prevotellaceae	<i>Paraprevotella</i>		0.003
				<i>Prevotella_9</i>		0.000
			Rikenellaceae	<i>Alistipes</i>		0.002
					<i>indistinctus</i>	0.009 *
					<i>shahii</i>	0.011
			Tannerellaceae	<i>Parabacteroides</i>	<i>putredinis</i>	0.022
						0.000
Cyanobacteria	Melainabacteria	Gastranaerophilales				0.029
Euryarchaeota	Methanobacteria	Methanobacteriales	Methanobacteriaceae	<i>Methanobrevibacter</i>		0.000
Firmicutes	Bacilli	Lactobacillales	Lactobacillaceae	<i>Lactobacillus</i>		0.000
			Christensenellaceae	<i>Christensenellaceae R-7</i>		0.000
				<i>Agathobacter</i>		0.000
				<i>Anaerostipes</i>		0.000
					<i>hadrus</i>	0.006
					<i>luti</i>	0.000
				<i>Blautia</i>	<i>stercoris</i>	0.001
						0.023
						0.000
			Lachnospiraceae	<i>Coprococcus_2</i>	<i>eutactus</i>	0.000
				<i>Coprococcus_3</i>	<i>comes</i>	0.021
				<i>Eisenbergiella</i>	<i>tayi</i>	0.038
				<i>GCA-900066575</i>		0.037
				<i>Lachnospira</i>	<i>pectinoschiza</i>	0.001
				<i>Lachnospiraceae_ND3007</i>		0.000
				<i>Lachnospiraceae_UCG-008</i>		0.031
				<i>Sellimonas</i>	<i>intestinalis</i>	0.034
				<i>Shuttleworthia</i>		0.001
				<i>Tyzzereella</i>		0.012
	Clostridia	Clostridiales	Peptococcaceae			0.000 *
			Peptostreptococcaceae	<i>Intestinibacter</i>	<i>bartlettii</i>	0.000 *
				<i>Candidatus_Soleaferrea</i>		0.013
				<i>DTU089</i>		0.001
				<i>Faecalibacterium</i>	<i>CM04-06</i>	0.019 *
				<i>Oscillibacter</i>		0.022
				<i>Oscillospira</i>		0.006
				<i>Ruminiclostridium_5</i>		0.004
				<i>Ruminococcaceae_NK4A214</i>		0.002
				<i>Ruminococcaceae_UCG-002</i>	<i>bacterium</i>	0.001
				<i>Ruminococcaceae_UCG-011</i>		0.000 *
				<i>Ruminococcus_1</i>	<i>bicirculans</i>	0.007
				<i>Ruminococcus_1</i>		0.021
				<i>Ruminococcus_2</i>		0.010
				<i>Ruminococcus_2</i>	<i>bromii</i>	0.018
	Erysipelotrichia	Erysipelotrichales	Erysipelotrichaceae	<i>Catenibacterium</i>	<i>mitsuokai</i>	0.000
				<i>Erysipelotrichaceae_UCG-003</i>		0.009
				<i>Faecalibaculum</i>	<i>rodentium</i>	0.000
				<i>Holdemanella</i>		0.000 *
				<i>Turicibacter</i>		0.036
	Negativicutes	Selenomonadales	Acidaminococcaceae	<i>Phascolarctobacterium</i>	<i>faecium</i>	0.017
			Veillonellaceae	<i>Dialister</i>		0.032
				<i>Megamonas</i>	<i>funiformis</i>	0.000
Proteobacteria	Deltaproteobacteria	Desulfovibrionales	Desulfovibrionaceae	<i>Bilophila</i>	<i>wadsworthia</i>	0.044
Tenericutes	Mollicutes	Mollicutes_RF39				0.000
Verrucomicrobia	Verrucomicrobiae	Verrucomicrobiales	Akkermansiaceae	<i>Akkermansia</i>	<i>muciniphila</i>	0.003
						0.015