

Table S1. Materials of FPE for animal and human.

Material	Animal	Human	Material	Animal	Human
Sugar			Vegetables and wild herbs		
Muscovado sugar	+	+	Eggplant	+	+
Oligosaccharide	+		Japanese mustard spinach	+	+
Fruits			Celery	+	+
Plum	+	+	Asian Pear	+	+
Strawberry	+	+	Bell pepper	+	+
Apple	+	+	Bitter melon	+	+
Grape	+	+	Bok choy	+	+
Tangerine	+	+	Cabbage	+	+
Peach	+	+	Indian lotus	+	+
Yuzu citrus fruit	+	+	Broccoli	+	+
Persimmon	+	+	Ginger	+	+
Kiwifruit	+	+	Asparagus	+	+
Kumquat	+	+	Parsley	+	+
Blueberry	+	+	Pumpkin	+	+
Raspberry	+	+	Japanese radish	+	+
Blackberry	+	+	Spinach	+	+
Iyokan citrus fruit	+	+	Carrot	+	+
Fig	+	+	Tomato	+	+
Lemon	+	+	Cucumber	+	+
Crismon glory vine	+		Japanese mugwort	+	
Chinese quince	+		Mallotus	+	
Silverberry	+		Bamboo grass	+	
Buerger raspberry	+		Field horsetail	+	
Red bayberry	+		Loquat leaf	+	
Prune	+		Japanese hornwort parsely	+	
Chocolate vine	+		Japanese ginger	+	
Broadleaf plaitain	+		Turmeric	+	
Seaweed			Vitamin-na	+	
Wakame seaweed	+	+	burdock root	+	
Sea kelp root	+		Water dropwort	+	
Bladder wrack	+		Barley grass	+	
Japanese seaweed	+		Kale	+	
Sea kelp	+		Perilla	+	
Pulse and cereals			Ginseng	+	
Brown rice	+	+	Jute mallow	+	
Soybean	+		Mushrooms		
Corn	+		Shiitake mushroom	+	+
Rice bran	+		Wood ear mushroom	+	+
Cacao beans	+		Hen of the woods mushroom	+	
			Lingzhi mushroom	+	

Table S2. Composition of experimental diet (%).

Compound	Negative group	Positive group	FPE group
Casein	20.0	20.0	19.7
Cornstarch	39.7	39.7	39.7
α -Cornstarch	13.2	13.2	13.2
Sucrose	10.0	10.0	5.5
Corn oil	7.0	7.0	7.0
Cellulose	5.0	5.0	4.8
Mineral mixture AIN-93G	3.5	3.5	3.5
Vitamin mixture AIN-93	1.0	1.0	1.0
L-Cystine	0.3	0.3	0.3
Choline bitartrate	0.3	0.3	0.3
FPE	0.0	0.0	5.0

Table S3. Nutritional compound and amino acid content in FPE produced from 40 kinds of extracts.

Compound	in 100g FPE
Water conten	37,800 mg
Protein	2,600 mg
Lipid	300 mg
Carbohydrate	56,300 mg
Ash	3,000 mg
Sodium	154 mg
Potassium	929 mg
Calcium	148 mg
Iron	3.2 mg
Dietary fiber	4,600 mg
Arginine	95 mg
Lysine	57 mg
Histidine	26 mg
Phenylalanine	56 mg
Tyrosine	43 mg
Leucine	98 mg
Isoleucine	54 mg
Methionine	25 mg
Valine	86 mg
Alanine	130 mg
Glycine	80 mg
Proline	120 mg
Glutamic acid	270 mg
Serine	80 mg
Threonine	63 mg
Aspartic acid	360 mg
Cystine	34 mg
Tryptophan	14 mg

Table S4. Microbiota composition at the order level in feces of placebo and FPE groups before and after 3 month-administration (%).

Order	Placebo group		FPE group	
	0 month	3 months	0 month	3 months
Actinomycetales	0.1 ± 0.0	0.1 ± 0.0	0.1 ± 0.0	0.1 ± 0.0
Bifidobacteriales	12.7 ± 1.2	12.2 ± 1.9	12.7 ± 2.0	12.8 ± 1.2
Coriobacteriales	3.5 ± 1.0	3.5 ± 1.3	4.0 ± 1.8	2.9 ± 1.3
Bacteroidales	36.1 ± 1.3	35.7 ± 1.5	32.2 ± 2.6	31.3 ± 1.2
Streptophyta	0	0	0.1 ± 0.1	0
Bacillales	0.1 ± 0.1	0	0.1 ± 0.1	0.4 ± 0.3
Lactobacillales	1.8 ± 0.5	2.3 ± 0.6	3.8 ± 1.3	4.2 ± 1.3
Turicibacteriales	0.5 ± 0.4	0.1 ± 0.1	2.3 ± 2.3	0.1 ± 0.0
Clostridiales	37.8 ± 1.6	38.0 ± 2.1	39.0 ± 1.8	43.6 ± 2.5 *
Erysipelotrichales	2.9 ± 0.9	2.2 ± 0.6	1.5 ± 0.4	1.8 ± 0.4
Fusobacteriales	0.2 ± 0.1	0.1 ± 0.1	0.2 ± 0.1	0.1 ± 0.1
Victivallales	0	0.10 ± 0.1	0.3 ± 0.2	0
RF32	0.5 ± 0.5	0	0.4 ± 0.4	0.1 ± 0.1
Burkholderiales	1.3 ± 0.3	1.5 ± 0.4	1.2 ± 0.3	1.4 ± 0.4
Desulfovibrionales	0.2 ± 0.1	0.2 ± 0.1	0.2 ± 0.1	0.2 ± 0.1
Enterobacteriales	1.7 ± 1.1	0.4 ± 0.3	1.3 ± 0.6	0.5 ± 0.2
Pasteurellales	0	0	0.6 ± 0.3	0.5 ± 0.2
ML615J-28	0	0.3 ± 0.3	0	0
Verrucomicrobiales	0.6 ± 0.5	3.2 ± 2.1	0	0

* $p < 0.05$, assessed using Student's t -test.

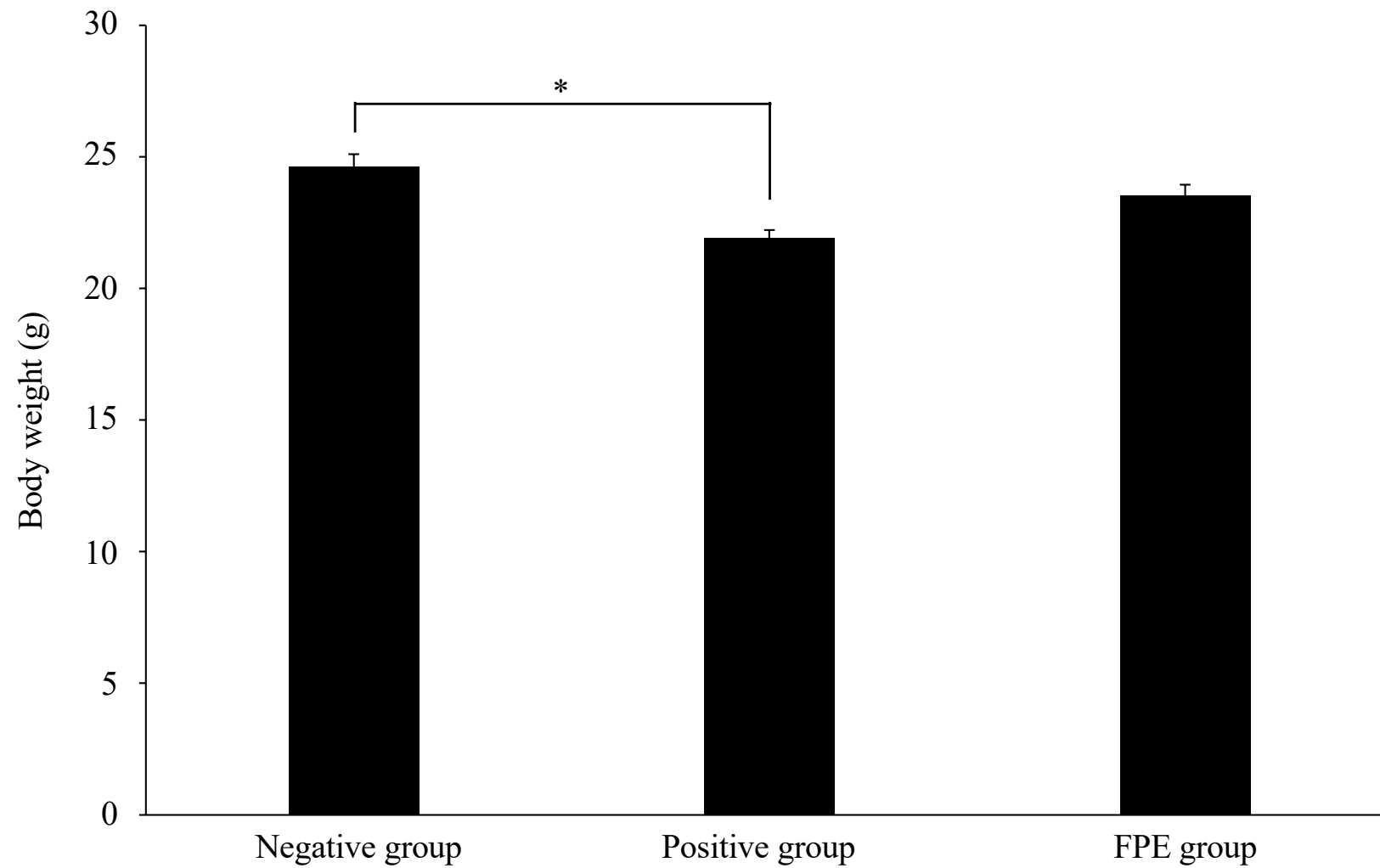


Figure S1. Body weight of mice after 7 day-administration. The values are expressed as means $\pm$ SEM ($n=8$). * $p < 0.05$, accessed using Bonferroni's multiple comparison test.



Figure S2. Colon length of mice after 7 day-administration.

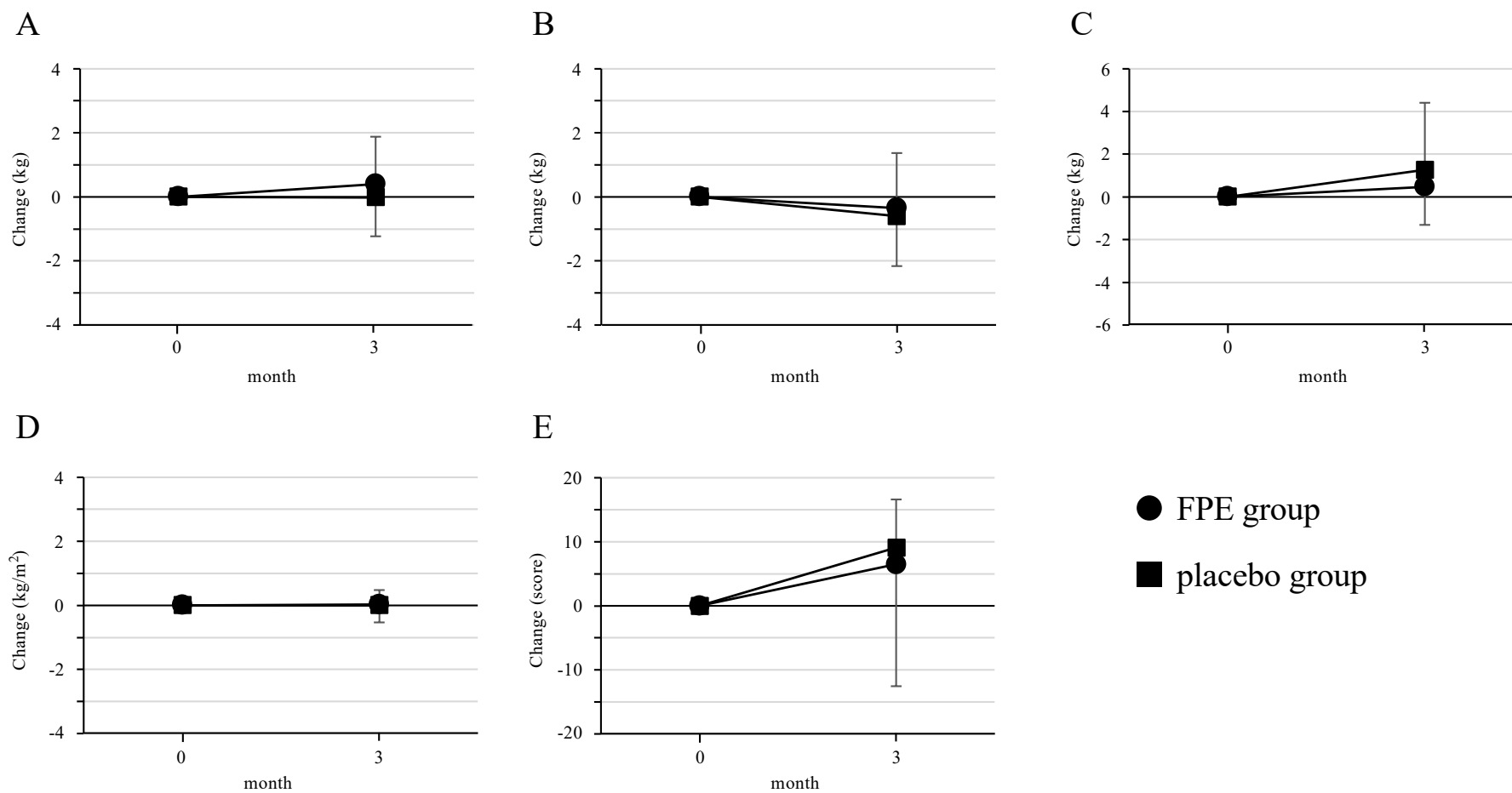


Figure S3. Change of body weight (A), fat mass (B), muscle mass (C), BMI (D), and health condition (E) of FPE group or placebo group. The values are expressed as means $\pm$ SD ($n=20$) assessed using Student's *t*-test.

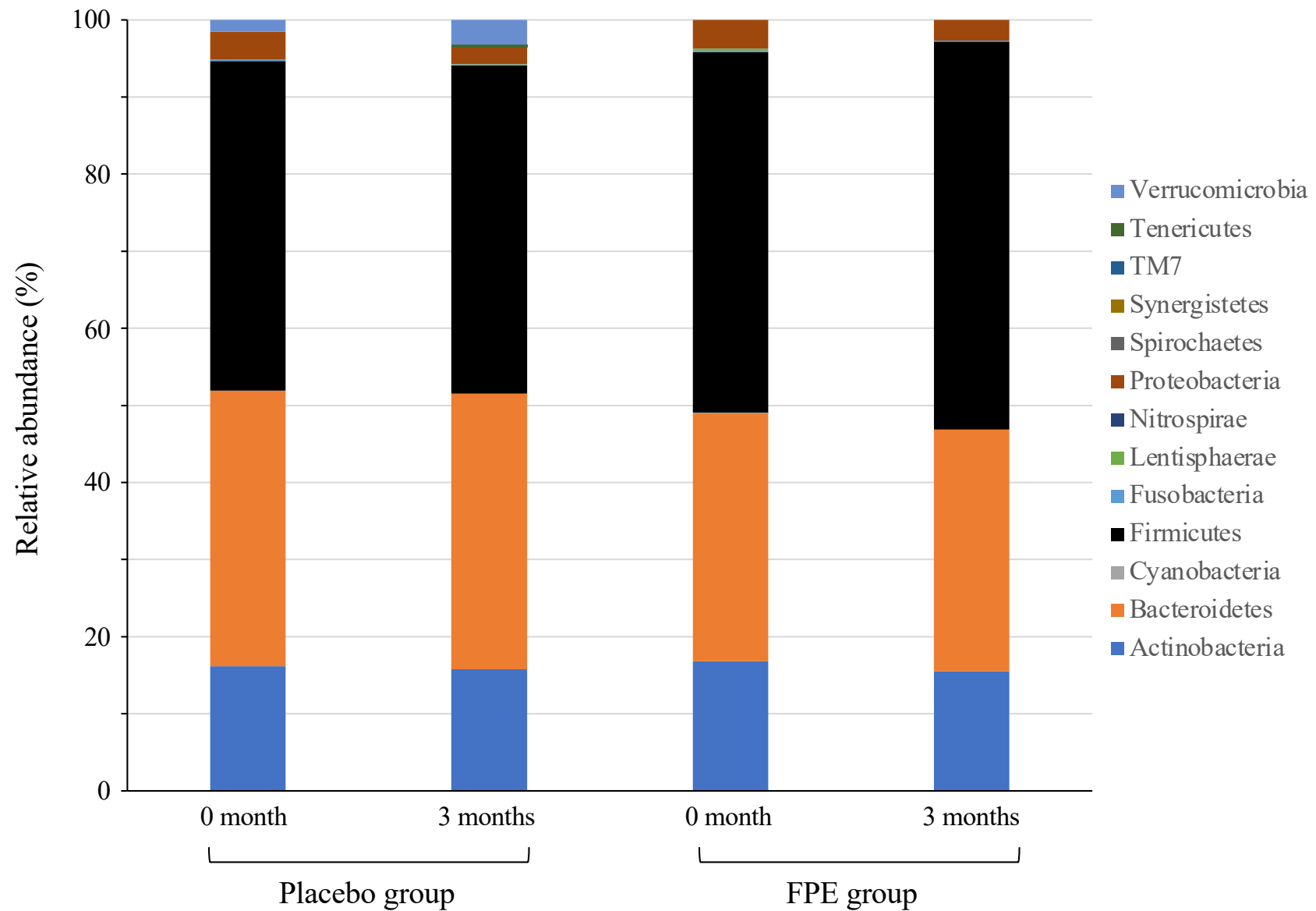


Figure S4. Microbiota composition at the phyla level in feces of placebo and FPE groups before and after 3 month-administration.