Supplementary Data

Supplementary Table 1. Transparent Reporting of Evaluations with Nonrandomized Designs (TREND) checklist.

Paper Section/ Topic	Item No	Descriptor	Reported? ✓	Reported? Pg #
Title and Abstract				
Title and Abstract	1	Information on how unit were allocated to interventions	✓	1; 4-5
		Structured abstract recommended	✓	4-5
		Information on target population or study sample	✓	4
Introduction				
Background	2	Scientific background and explanation of rationale	✓	6-8
		Theories used in designing behavioral interventions	✓	6-8
Methods				
Participants	3	Eligibility criteria for participants, including criteria at different levels in recruitment/sampling plan (e.g., cities, clinics, subjects)	✓	11-12
		Method of recruitment (e.g., referral, self-selection), including the sampling method if a systematic sampling plan was implemented	✓	11
		Recruitment setting	✓	11
		Settings and locations where the data were collected	✓	11
\Interventions	4	Details of the interventions intended for each study condition and how and when they were actually administered, specifically including:	✓	12
		o Content: what was given?	✓	12
		o Delivery method: how was the content given?	✓	12

		○ Unit of delivery: how were the subjects grouped during delivery?	✓	12
		○ Deliverer: who delivered the intervention?	✓	12
		○ Setting: where was the intervention delivered?	✓	12
		○ Exposure quantity and duration: how many sessions or episodes or events were intended to be delivered? How long were they intended to last?	✓	12
		○ Time span: how long was it intended to take to deliver the intervention to each unit?	✓	12
		○ Activities to increase compliance or adherence (e.g., incentives)	✓	12
Objectives	5	Specific objectives and hypotheses	✓	4; 7-8
Outcomes	6	Clearly defined primary and secondary outcome measures	✓	8
		Methods used to collect data and any methods used to enhance the quality of measurements	✓	13-18
		Information on validated instruments such as psychometric and biometric properties	✓	13-18
Sample Size	7	How sample size was determined and, when applicable, explanation of any interim analyses and stopping rules	✓	17
Assignment Method	8	Unit of assignment (the unit being assigned to study condition, e.g., individual, group, community)	✓	12
		Method used to assign units to study conditions, including details of any restriction (e.g., blocking, stratification, minimization)	N/A	N/A
		Inclusion of aspects employed to help minimize potential bias induced due to non-randomization (e.g., matching)	N/A	N/A
Blinding (masking)	9	Whether or not participants, those administering the interventions, and those assessing the outcomes were blinded to study condition assignment; if so, statement regarding how the blinding was accomplished and	N/A	N/A

		how it was assessed.		
Unit of Analysis	10	Description of the smallest unit that is being analyzed to assess intervention effects (e.g., individual, group, or community)	✓	12; 17
		If the unit of analysis differs from the unit of assignment, the analytical method used to account for this (e.g., adjusting the standard error estimates by the design effect or using multilevel analysis)	N/A	N/A
Statistical Methods	11	Statistical methods used to compare study groups for primary methods outcome(s), including complex methods of correlated data	✓	18
		Statistical methods used for additional analyses, such as a subgroup analyses and adjusted analysis	✓	18
		Methods for imputing missing data, if used	N/A	N/A
		Statistical software or programs used	✓	18
Results				
Participant flow	12	Flow of participants through each stage of the study: enrollment, assignment, allocation, and intervention exposure, follow-up, analysis (a diagram is strongly recommended)	✓	Figure 2; 19-20
		o Enrollment: the numbers of participants screened for eligibility, found to be eligible or not eligible, declined to be enrolled, and enrolled in the study	✓	Figure 2; 19-20
		o Assignment: the numbers of participants assigned to a study condition	✓	Figure 2; 19
		o Allocation and intervention exposure: the number of participants assigned to each	✓	Figure 2;

		study condition and the number of participants who received each intervention		19
		o Follow-up: the number of participants who completed the follow- up or did not complete the follow-up (i.e., lost to follow-up), by study condition	✓	Figure 2; 19-20
		o Analysis: the number of participants included in or excluded from the main analysis, by study condition	✓	19-20
		Description of protocol deviations from study as planned, along with reasons	✓	19
Recruitment	13	Dates defining the periods of recruitment and follow-up	✓	11
Baseline Data	14	Baseline demographic and clinical characteristics of participants in each study condition	✓	20; Tables 2 and 3
		Baseline characteristics for each study condition relevant to specific disease prevention research	✓	20
		Baseline comparisons of those lost to follow-up and those retained, overall and by study condition	✓	20
		Comparison between study population at baseline and target population of interest	✓	20
Baseline equivalence	15	Data on study group equivalence at baseline and statistical methods used to control for baseline differences	✓	20; Tables 2 and 3
Numbers analyzed	16	Number of participants (denominator) included in each analysis for each study condition, particularly when the denominators change for different outcomes; statement of the results in absolute numbers when feasible	✓	19; Figure 2; Tables 2 and 3
		Indication of whether the analysis strategy was “intention to treat” or, if not, description of how non-compliers were treated in the analyses	✓	19-20

Outcomes and estimation	17	For each primary and secondary outcome, a summary of results for each estimation study condition, and the estimated effect size and a confidence interval to indicate the precision	✓	19-21 Tables 2 and 3
		Inclusion of null and negative findings	✓	19-21 Tables 2 and 3
		Inclusion of results from testing pre-specified causal pathways through which the intervention was intended to operate, if any	✓	19-21 Tables 2 and 3
Ancillary analyses	18	Summary of other analyses performed, including subgroup or restricted analyses, indicating which are pre-specified or exploratory	✓	21
Adverse events	19	Summary of all important adverse events or unintended effects in each study condition (including summary measures, effect size estimates, and confidence intervals)	N/A	N/A
Discussion				
Interpretation	20	Interpretation of the results, taking into account study hypotheses, sources of potential bias, imprecision of measures, multiplicative analyses, and other limitations or weaknesses of the study	✓	22-30
		Discussion of results taking into account the mechanism by which the intervention was intended to work (causal pathways) or alternative mechanisms or explanations	✓	22-30
		Discussion of the success of and barriers to implementing the intervention, fidelity of implementation	✓	29-30
		Discussion of research, programmatic, or policy implications	✓	29

Generalizability	21	Generalizability (external validity) of the trial findings, taking into account the study population, the characteristics of the intervention, length of follow-up, incentives, compliance rates, specific sites/settings involved in the study, and other contextual issues	✓	29-30
Overall Evidence	22	General interpretation of the results in the context of current evidence and current theory	✓	22-30

Source: Des Jarlais, D. C., Lyles, C., Crepaz, N., & the Trend Group (2004). Improving the reporting quality of nonrandomized evaluations of behavioral and public health interventions: The TREND statement. *American Journal of Public Health*, 94, 361-366. For more information, visit: http://www.cdc.gov/trendstatement/

Supplementary Table 2. Primers used for qPCR.

Gene	Commercial Name	Assay ID
ACTB	ACTB	Hs99999903_m1
SREBP-1c	SREBF1	Hs00231674_m1
PPARγ	PPARG	Hs01115513_m1
NF-κB	NFKB1	Hs00765730_m1
GLUT4	SLC2A4	Hs00168966_m1
IRS-1	IRS1	Hs00178563_m1
PGC-1α	PPARGC1A	Hs00173304_m1
PAI-1	SERPINE1	Hs00167155_m1
TNF	TNF	Hs00174128_m1
Leptin	LEP	Hs00174877_m1
Adiponectin	ADIPOQ	Hs00977214_m1
PGK1	PGK1	Hs99999906_m1
PPIA	PPIA	Hs99999904_m1

Abbreviations: ACTB: Beta-Actin; SREBP-1c: Sterol Regulatory Element-Binding Protein 1c; PPARγ: Peroxisome Proliferator-Activated Receptor Gamma; NF-κB: Nuclear Factor Kappa B; GLUT4: Glucose Transporter 4; IRS-1: Insulin Receptor Substrate 1; PGC-1α: Peroxisome Proliferator-Activated Receptor Gamma Coactivator 1 Alpha; PAI-1: Plasminogen Activator Inhibitor-1; TNF: Tumor Necrosis Factor; PGK1: Phosphoglycerate Kinase 1; PPIA: Peptidylprolyl Isomerase A.

Supplementary Table 3. Participants' adherence to the study.

Group	Participant	Missing days (total)	When
Normal weight group	V1	0	
	V2	0	
	V4	0	
	V5	3	2 times on week 1; 1 time on week 3
	V6	0	
	V7	0	
	V8	1	1 time on week 2
	V9	2	1 time on week 2; 1 time on week 7
	V10	0	
	V14	0	
	V16	0	
	V17	1	1 time on week 6
	V18	0	
	V26	0	
	V27	0	
	V28	0	
	V29	0	
	V31	1	1 time on week 3
	V32	0	

	V34	0	
	Total	**8**	
Obese group	V11	0	
	V12	0	
	V13	0	
	V15	0	
	V20	0	
	V21	3	2 times on week 1; 1 time on week 2
	V22	0	
	V23	1	1 time on week 6
	V25	0	
	V30	0	
	V35	2	1 time on week 4; 1 time on week 8
	V37	1	1 time on week 3
	V38	1	1 time on week 5
	V39	1	1 time on week 2
	V40	0	
	V42	0	
	Total	**9**	

Supplementary Table 4. Partial eta squared and observed power for analysis involving anthropometric characteristics of participants.

	Partial Eta Squared	Observed Power
Body weight		
Within group	0.154	0.662
Between group	0.190	0.771
Interaction	0.190	0.771
BMI		
Within group	0.038	0.200
Between group	0.070	0.335
Interaction	0.070	0.335
WC		
Within group	0.000	0.051
Between group	0.002	0.056
Interaction	0.002	0.056
Body fat (%)		
Within group	0.034	0.182
Between group	0.073	0.347
Interaction	0.073	0.347
Waist-hip ratio		
Within group	0.099	0.454
Between group	0.071	0.338
Interaction	0.071	0.338
Waist-to-height ratio		
Within group	0.023	0.138
Between group	0.008	0.081
Interaction	0.008	0.081
Conicity index		

Within group	0.158	0.676
Between group	0.116	0.526
Interaction	0.116	0.526

Supplementary Table 5. Partial eta squared and observed power for analysis involving glucose metabolism markers.

	Partial Eta Squared	Observed Power
Glucose (mg/dL)		
Within group	0.357	0.977
Between group	0.114	0.478
Interaction	0.114	0.478
Insulin (IU/L)		
Within group	0.207	0.786
Between group	0.004	0.063
Interaction	0.004	0.063
HOMA-IR		
Within group	0.437	0.994
Between group	0.134	0.520
Interaction	0.134	0.520
HOMA-β		
Within group	0.134	0.518
Between group	0.035	0.164
Interaction	0.035	0.164
QUICKI Index		
Within group	0.494	0.999
Between group	0.097	0.389
Interaction	0.097	0.389

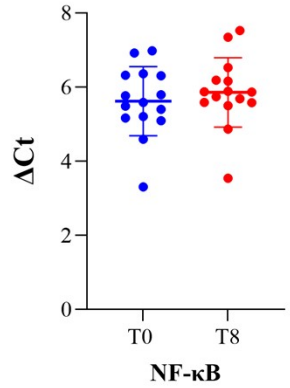
Supplementary Table 6. Partial eta squared and observed power for analysis involving inflammatory markers.

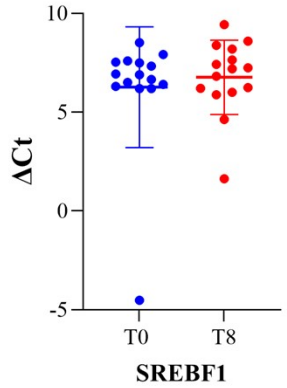
	Partial Eta Squared	Observed Power
C3 (mg/dL)		
Within group	0.111	0.504
Between group	0.010	0.086
Interaction	0.010	0.086
hs-CRP (mg/L)		
Within group	0.222	0.821
Between group	0.159	0.649
Interaction	0.159	0.649
INF-γ (pg/mL)		
Within group	0.415	0.990
Between group	0.004	0.061
Interaction	0.004	0.061
IL-1β (pg/mL)		
Within group	0.061	0.272
Between group	0.047	0.218
Interaction	0.047	0.218
IL-2 (pg/mL)		
Within group	0.065	0.313
Between group	0.071	0.336
Interaction	0.071	0.336
IL-4 (pg/mL)		
Within group	0.145	0.616
Between group	0.000	0.051
Interaction	0.000	0.051
IL-6 (pg/mL)		
Within group	0.185	0.758

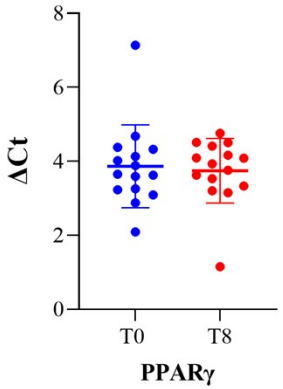
Between group	0.014	0.102
Interaction	0.014	0.102
IL-8 (pg/mL)		
Within group	0.183	0.738
Between group	0.055	0.263
Interaction	0.055	0.263
IL-10 (pg/mL)		
Within group	0.148	0.598
Between group	0.006	0.069
Interaction	0.006	0.069
IL-12p70 (pg/mL)		
Within group	0.393	0.993
Between group	0.062	0.292
Interaction	0.062	0.292
IL-13 (pg/mL)		
Within group	0.061	0.297
Between group	0.003	0.062
Interaction	0.003	0.062
TNF-α (pg/mL)		
Within group	0.214	0.828
Between group	0.007	0.077
Interaction	0.007	0.077

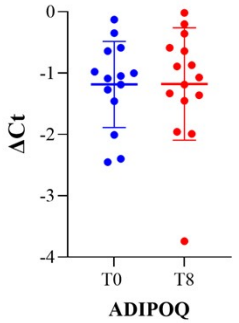
Supplementary Table 7. Partial eta squared and observed power for analysis involving oxidative stress markers.

	Partial Eta Squared	Observed Power
FRAP (mmol/mL)		
Within group	0.290	0.945
Between group	0.025	0.144
Interaction	0.025	0.144
MDA (µM/mg)		
Within group	0.427	0.996
Between group	0.032	0.165
Interaction	0.032	0.165
NO (µM/mL)		
Within group	0.226	0.802
Between group	0.008	0.076
Interaction	0.008	0.076
SOD (U/mL)		
Within group	0.068	0.299
Between group	0.002	0.057
Interaction	0.002	0.057


ΔCt
8
6
4
2
0
T0
T8
NF-κB


ΔCt
10
5
0
-5
T0
T8
SREBF1


ΔCt
8
6
4
2
0
T0
T8
PPARγ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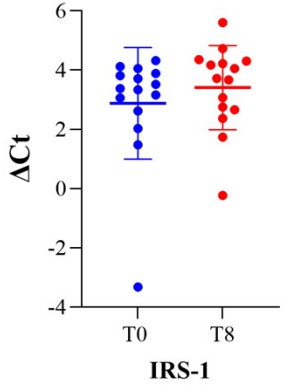
-3
-4
T0
T8
ADIPOQ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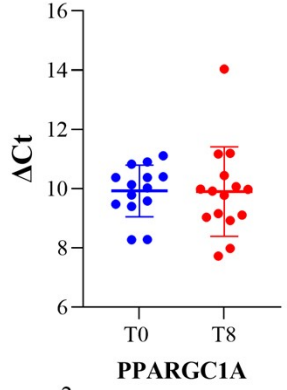
0
-2
-4
T0
T8
IRS-1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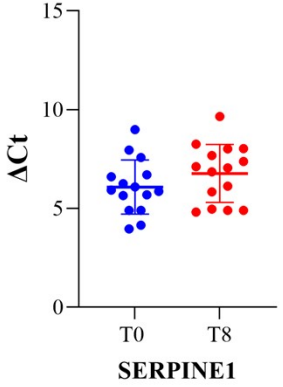
14
12
10
8
6
T0
T8
PPARGC1A


ΔCt
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10
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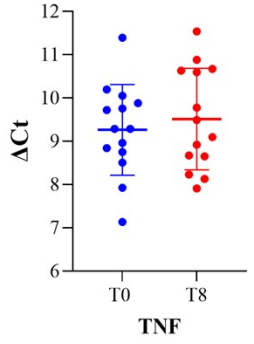
T0
T8
SERPINE1


ΔCt
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11
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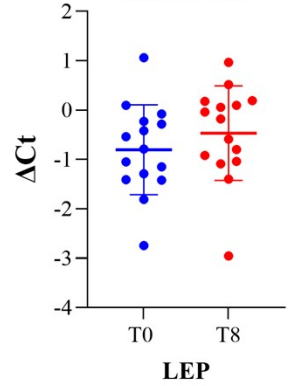
T0
T8
TNF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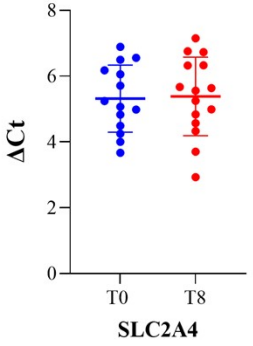
-1
-2
-3
-4
T0
T8
LEP


ΔCt
8
6
4
2
0
T0
T8
SLC2A4

Supplementary Figure 1. Individual delta Ct (ΔCt) values of target genes in the subcutaneous adipose tissue of individuals with obesity (n=14) assessed by qPCR at baseline (T0) and after 8 weeks of black tea kombucha consumption (T8). Each dot represents one participant; horizontal bars indicate mean ± SD. *Abbreviations:* NF-κB: Nuclear Factor Kappa B; SREBF1: Sterol Regulatory Element Binding Transcription Factor 1; PPARγ: Peroxisome Proliferator-Activated Receptor Gamma; ADIPOQ: Adiponectin; IRS-1: Insulin Receptor Substrate 1; PPARGC1A: Peroxisome Proliferator-Activated Receptor Gamma Coactivator 1-alpha; SERPINE1: Serpin Family E Member 1; TNF: Tumor Necrosis Factor; LEP: Leptin; SLC2A4; Solute Carrier Family 2 Member 4.