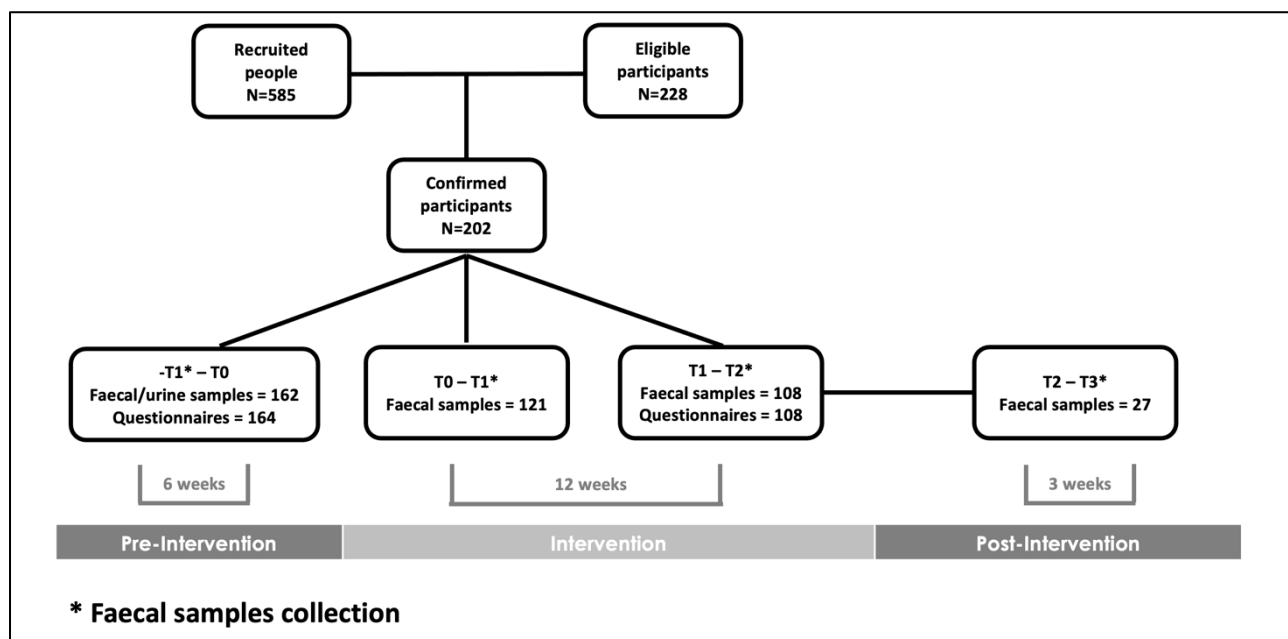


Adults' nutritional intervention

The intervention on adults, planned to be realized in Spain and Germany, was implemented only in Spain where ethical approval was obtained.

Participant Flow: Spanish intervention



Baseline Characteristics of 204 randomized subjects

	Level1		Level2	
	Control	Treated	Control	Treated
Age, Mean (SD)	45.05 (9,20)	43.76 (9,38)	43.98 (11,01)	42.20 (10,87)
Gender, n (%)				
Female	28 (68,3)	30 (73,2)	36 (59,0)	37 (60,7)
Male	13 (31,7)	11 (26,8)	25 (41,0)	24 (39,9)
BMI, Mean (SD)	25.33 (3,15)	24.50 (2,87)	24.64 (3,05)	24.36 (2,96)

Results of the Spanish intervention

	Level 1				Level 2			
	Control		Treated		Control		Treated	
	pre	post	pre	post	pre	post	pre	post
Primary outcomes								
1. Variation in alpha diversity								
Shannon	4.28	4.40	4.26	4.15	4.33	4.36	4.24	4.31
2. Adoption of healthy and sustainable diet								
HDAS	25.61	24.67	26.30	27.17	24.16	25.84	25.76	26.86
fMD	2.61	3.17	3.25	3.28	2.76	3.12	2.92	3.30
rMed	7.30	7.50	8.00	8.44	7.37	8.40	7.96	8.86
Secondary outcomes								
3. Food intake								
Energy_kcal	2,114.3	1,973.5	2,292.2	2,099.0	2,052.4	1,983.4	2,286.2	2,119.0
Vegetables	166.44	181.94	223.01	202.18	164.46	246.94	186.67	225.29
Tubers	28.50	33.00	23.06	19.77	33.40	24.88	28.73	28.64
Fruits	213.79	265.90	223.14	258.64	199.85	238.61	241.05	281.34
Nuts and spices	9.86	11.63	18.22	13.04	11.66	15.84	13.29	11.58
Legumes	31.38	24.12	27.81	29.20	31.57	25.69	29.22	29.22
Cereals	43.37	50.38	48.79	46.30	45.34	50.70	50.19	50.93
Milk and milk products	163.39	163.81	178.16	146.48	182.24	163.23	156.35	161.36
Oils and fats	12.30	8.81	8.01	8.90	8.95	8.36	8.42	9.07
Eggs, meats and meat derivatives	91.07	99.55	61.44	81.85	92.81	78.95	77.71	83.44
Fish and fish products, seafood and Pastry	66.84	62.47	68.25	89.33	58.75	80.55	65.41	75.07
Beverages without alcohol	17.34	20.04	15.84	16.13	14.59	10.28	17.31	12.05
Alcoholic beverages	680.39	737.15	599.52	733.11	728.63	661.40	624.17	703.55
Miscellaneous	45.81	39.67	58.32	34.54	68.73	66.84	43.37	44.99
	27.64	24.42	17.71	18.42	29.65	26.65	22.75	19.92
4. Physical activity levels								
Sedentary	3 (13%)	2 (17%)	4 (20%)	5 (28%)	11	7 (28%)	12	7 (19%)
Moderately active	12 (52%)	5 (42%)	10 (50%)	8 (44%)	12 (32%)	9 (36%)	15 (31%)	13 (35%)
Active	8 (35%)	5 (42%)	6 (30%)	5 (28%)	1 (2.6%)	2 (8.0%)	5 (10%)	4 (11%)
Athlete	0 (0%)	0 (0%)	0 (0%)	0 (0%)	14	7 (28%)	17	13
5. Sleep duration								
Sleep hours per night	7.40	7.25	9.66	9.31	7.68	7.34	7.65	7.39

Pre: baseline; Post: 12 weeks. HDAS: Healthy Dietary Adherence Score; fMDS: Food frequency-based Mediterranean Diet Score; rMED: Revised Mediterranean Diet adherence score.

Consumer empowerment through technology adoption (Primary outcome)

More than 50% of participants in both intervention and control group at the end of the study said they would use the intervention and its components if it were free of charge or would be willing to pay. Participants in both the intervention and control groups were least enthusiastic about the wristband and nutraceuticals (over 40% said they would not use these services even if they were free of charge), and most enthusiastic about gut microbiota analysis (44% would be willing to pay for this service).

After the study ended, less than 50% in both intervention and control groups altered their preference from that stated at the start. Nevertheless, after having experience using these services, more participants reduced their stated willingness to use or buy the intervention than increased it over the course of the study.

Table 3 shows the stated preferences of the treatment and control groups to use or pay for the services at the end of the study, and Table 4 shows the change in these preferences over the course of the study.

Table 3. Preferences at the end of the study for each component of the intervention

	Control(N=48)	Treated(N=60)	Total (N=108)	% oftotal
Application				
0	12	18	30	28%
1	32	38	70	65%
2	4	4	8	7%
	Control	Treated	Total	
Professional advice				
0	7	11	18	17%
1	29	38	67	62%
2	12	11	23	21%
	Control	Treated	Total	
Wristband				
0	22	28	50	46%
1	22	26	48	44%
2	4	6	10	9%
	Control	Treated	Total	
Intestinal analysis				
0	4	6	10	9%
1	28	23	51	47%
2	16	31	47	44%
	Control	Treated	Total	
Fortified products				
0	16	25	41	38%
1	22	27	49	45%

2	10	8	18	17%
	Control	Treated	Total	
Neutraceuticals				
0	17	27	44	41%
1	22	24	46	43%
2	9	9	18	17%
	Control	Treated	Total	
Complete				
0	14	21	35	32%
1	27	30	57	53%
2	7	9	16	15%

Table 4. Change in preferences for each component of the intervention

	Control	Treated	Total	
Application				
-2	1	1	2	2%
-1	13	16	29	27%
0	31	34	65	60%
1	3	9	12	11%
2	0	0	0	0
Professional advice				
-2	2	4	6	6%
-1	14	20	34	31%
0	27	31	58	54%
1	3	5	8	7%
2	2	0	2	2%
Wristband				
-2	8	7	15	14%
-1	12	17	29	27%
0	25	32	57	53%
1	2	4	6	6%
2	1	0	1	1%
Intestinal analysis				
-2	0	1	1	1%
-1	9	9	18	17%
0	29	38	67	62%
1	9	10	19	18%
2	1	2	3	3%
Fortified products				
-2	2	6	8	7%
-1	6	11	17	16%
0	25	32	57	53%
1	13	8	21	19%
2	2	3	5	5%
Neutraceuticals				
-2	2	6	8	7%
-1	7	15	22	20%
0	28	30	58	54%
1	9	5	14	13%
2	2	4	6	6%
Complete				
-2	5	6	11	10%
-1	8	13	21	19%
0	29	35	64	59%
1	6	6	12	11%
2	0	0	0	0

Analysis 1 HRQOL (Secondary outcome)

HRQOL was measured by the EuroQOL EQ-5D-5L instrument. This consists of 5 questions relating to the participants health on that day. The 5 dimensions are mobility, selfcare, normal activities, pain or discomfort, and anxiety or depression. Each can be scored at 5 levels, where 1 represents the best health and 5 the worst level.

The EQ-5D-5L questionnaire can be used to calculate a summary index value of overall health known as a “tariff”. The tariff for a given health state for the EQ-5D has been calculated using population norms for Spain(2). The tariff can take values between 1 (representing no health problems) and 0 (representing a health state that the general population considers equivalent to death). Tariff values less than 0 are also theoretically possible.

This report compares the change in EQ-5D-5L tariff over the 12 week trial period, comparing between the intervention and control groups using an OLS regression model.

Comparison of the change in health-related quality of life (HRQOL: EuroQOL EQ-5D-5L) between the intervention and control groups

	Change in control group at Level 1	p-value	Change in control group at Level 2	p-value	Change in treatment group at Level1	p-value	Change in treatment group at Level2	p-value
EQ5D tariff	-0.026	NS	0.017	NS	-0.013	NS	0.022	NS

Urine metabolomics (Secondary outcome)

Urine samples of 96 subjects were analysed. A metabolomic MetaCliniq study was performed mainly based on the analysis of organic acids, amino acids, purines, acylcarnitines, and other metabolites or toxic derivatives in urine. The study of organic acids, compounds formed during fundamental metabolic processes in the body by the digestion of proteins, fats, and dietary carbohydrates, has made it possible to discard most of the metabolic disease innate by the intermediate metabolism or vitamin or co-Factor defects reflected in intermediate metabolic changes.

Referred to innate metabolic diseases, the metabolic profile can be considered normal in all urine samples. However, about 66 samples appeared altered. In many samples, a moderate/large portion of indicators of inflammation and intestinal permeability such as lysine, histidine, 1-methylpyristidine, and mannitol was found.