Supplemental Table 1. Demographics, Bowel Diary, Fasting Serum C4 and Fecal BA Measured from Random, Single and 48-Hour Stool Samples

	Healthy	IBS-D without BAD	IBS-D with BAD	Terminal ileum resection	Kruskal-Wallis p
N	25	34	25	4	
Age (years)	39.5 ± 10.7	41.8 ± 10.7	46 ± 12.9	50.75 ± 22.6	0.2
Sex (F/M)	18/7	26/8	19/6	0/4	0.01
BMI (kg/m^2)	24.8 ± 3.1^#	30.6 ± 8.0#	33.5 ± 7.0^	28 ± 6.8	0.0001
Stool frequency (BM/day)	1.3 ± 0.7 *^#	2.2 ± 1.1*^#	3.3 ± 2.0^	5.4 ± 1.7	<0.001
Stool consistency (BSFS)	4.1 ± 0.5*^	4.4 ± 1.1*^	5.5 ± 0.8^	6.2 ± 0.2	<0.001
C4 (ng/mL)	13.6 ± 9.0^	19.8 ± 14.2^#	50.5 ± 31.5^#		<0.001
Single stool					
Primary BA (%)	2.5 ± 4.2*	2.2 ± 4.1*^	19.5 ± 27.3*^	73.4 ± 18.2	0.002
Primary BA (µmol/L)	2.8 ± 8.4*^	2.9 ± 8.4*^	45.1 ± 85.2*^	345.2 ± 188.5	<0.001
CDCA (%)	1.0 ± 1.1*	1.2 ± 1.8*^	8.6 ± 12.3*^	24.0 ± 3.2	0.002
CDCA (µmol/L)	0.94 ± 1.9*^	1.45 ± 3.3*^	19.25 ± 36.3*^	129.5 ± 98.4	0.0003
CA (%)	1.4 ± 3.2*	1.0 ± 2.4*^	10.9 ± 15.6*^	49.4 ± 18.1	0.0007
CA (µmol/L)	1.8 ± 6.6*^	1.5 ± 5.3*^	25.6 ± 49.7*^	215.7 ± 96.4	0.0002
DCA (%)	50.4 ± 13.4*	55.5 ± 12.1*	47.2 ± 16.9*	16.1 ± 16.3	<0.01
DCA (µmol/L)	37.7 ± 35.7	61.5 ± 53.8	67.8 ± 47.6	114.9 ± 142.5	0.14
LCA (%)	46.4 ± 15.6*^	41.3 ± 13.4*^	30.9 ± 15.9*^	3.8 ± 4.3	<0.001
LCA (µmol/L)	25.0 ± 14.5	37.5 ± 24.7	37.3 ± 22.8	30.0 ± 43.9	0.1
Total fecal BA (µmol)	212 ± 249^	260 ± 290.4	534.2 ± 561.8^	973.8 ± 1201	0.04
Stool weight (g)	106.8 ± 99.8	88.1 ± 67.7	127 ± 100.9	97 ± 82.8	0.26
48 hour stool sample					
Primary BA (%)	2.94 ± 5.4*^	2.1 ± 2.6*^	27.2 ± 21.3*^	82.4 ± 15.3	<0.0001
Primary BA (µmol/L)	1.6 ± 2.9*^	2.2 ± 3.0*^	56.9 ± 69.8*^	258.5 ± 86.4	<0.0001
CDCA (%)	1.7 ± 3.2*^	1.2 ± 1.4*^	10.9 ± 7.1*^	31.4 ± 4.6	<0.0001
CDCA (µmol/L)	0.92 ± 1.8*^	1.23 ± 1.7*^	22.9 ± 26.4*^	100.3 ± 41	<0.0001
CA (%)	1.23 ± 2.3*^	0.9 ± 1.3*^	16.4 ± 14.5*^	51 ± 11.9	<0.0001
CA (µmol/L)	0.67 ± 1.2*^	0.9 ± 1.4*^	34.0 ± 44.1*^	158.2 ± 48	<0.0001
DCA (%)	56.6 ± 11.9*^	56.9 ± 9.4*^	47.2 ± 14.9*^	9.5 ± 13.3	0.0013
DCA (µmol/L)	39.1 ± 28.7^#	61.6 ± 46.8^#	97.2 ± 71.7^	47.5 ± 75.5	0.006

LCA (%)	39.5 ± 12.5*^	40.0 ± 10.1*^	23.3 ± 10.9*^	2.7 ± 4.5	<0.0001
LCA (µmol/L)	24.7 ± 17^#	38.9 ± 24.4#	41.6 ± 34.2^	14.3 ± 24.5	0.03
Total fecal BA (µmol)	585.8 ± 465*^	718 ± 598.2*^	1891.6 ± 848^	7204 ± 8500	<0.0001
Stool weight (g/48h)	318.9 ± 165^	287.3 ± 123^	527.3 ± 257^	993 ± 950	0.0001

* represents significant difference (p<0.05) to terminal ileum resection patients

^ represents significant difference (p< 0.05) to IBS-D with BAD; # represents significant difference (p< 0.05) to IBS-D without BAD

BA=bile acid; BAD=bile acid diarrhea; BM=bowel movement; BSFS=Bristol Stool Form Scale; C4=7a-hydroxy-4-cholesten-3-one; CA=cholic acid; CDCA=chenodeoxycholic acid; DCA=deoxycholic acid; IBS-D=diarrhea-predominant irritable bowel syndrome; LCA=lithocholic acid; [75]SeHCAT=[75]selenium homocholic acid taurine

Supplemental Table 2. BAD diagnostic accuracy of fasting serum C4 >52.5ng/mL and various cut-offs for single stool primary BA (%)

All participants with measurements of serum C4 and single stool primary BA % using 10% cut-off			
Fasting serum C4 and primary BA % in single stool sample	**Diagnosis based on 48-hour stool sample**		**Predictive value**
	BAD (+)	**BAD (-)**	
C4 >52.5 ng/mL or primary BA >10%	19	3	**PPV = 86%**
C4 <52.5 ng/mL and primary BA <10%	10	56	**NPV = 85%**
	Sensitivity = 66%	**Specificity = 95%**	
All participants with measurements of serum C4 and single stool primary BA % using 15% cut-off			
C4 >52.5 ng/mL or primary BA >15%	19	2	**PPV = 90%**
C4 <52.5 ng/mL and primary BA <15%	10	57	**NPV = 85%**
	Sensitivity = 66%	**Specificity = 97%**	
All participants with measurements of serum C4 and single stool primary BA % using 20% cut-off			
C4 >52.5 ng/mL or primary BA >20%	19	2	**PPV = 90%**
C4 <52.5 ng/mL and primary BA <20%	10	57	**NPV = 85%**
	Sensitivity = 66%	**Specificity = 97%**	
Only IBS-D participants with measurements of serum C4 and single stool primary BA % using 10% cut-off			
C4 >52.5 ng/mL or primary BA >10%	15	2	**PPV = 88%**
C4 <52.5 ng/mL and primary BA <10%	10	32	**NPV = 76%**
	Sensitivity = 60%	Specificity = 94%	

BA=bile acid; BAD=bile acid diarrhea; C4=7a-hydroxy-4-cholesten-3-one; IBS-D=diarrhea-predominant irritable bowel syndrome