

**Supplementary Table 1. Proportion of discarded reads and counts of OTUs or ASVs after combined clustering or denoising of amplicons with different sequence lengths.**

Type of 16S amplicon data	Method	Percentage (%) of discarded reads at each length										Number of ASVs/OTUs after combined clustering/denoising	Number of input bacterial strains
		100	150	170	200	250	300	350	400	450	Original		
V1V3 (forward)	DADA2-DeNovo-ASV	6.43	8.06	9.26	10.01	10.57	11.06	11.59	12.15	13.40	13.75	115,446	18,257
	UCLUST-ClosedRef-0.97	10.09	17.37	24.14	24.45	25.35	21.14	21.70	18.29	22.51	21.98	18,831	18,257
	UCLUST-ClosedRef-1.00	40.13	56.49	59.89	63.64	66.54	68.03	70.36	71.23	72.96	72.87	9,359	18,257
	UCLUST-DeNovo-0.97	0	0	0	0	0	0	0	0	0	0	20,020	18,257
	UCLUST-DeNovo-1.00	0	0	0	0	0	0	0	0	0	0	360,329	18,257
	VSEARCH-DeNovo-0.97	0	0	0	0	0	0	0	0	0	0	10,771	18,257
	VSEARCH-DeNovo-0.99	0	0	0	0	0	0	0	0	0	0	13,650	18,257
	VSEARCH-DeNovo-1.00	0	0	0	0	0	0	0	0	0	0	15,668	18,257
V1V3 (reverse)	DADA2-DeNovo-ASV	4.53	5.74	6.13	6.54	7.25	8.51	10.34	10.84	12.58	13.70	101,887	18,257
	UCLUST-ClosedRef-0.97	4.99	5.68	3.95	3.55	5.76	5.81	13.39	11.65	17.72	21.98	23,810	18,257
	UCLUST-ClosedRef-1.00	25.57	35.58	44.04	48.01	57.71	59.43	64.13	65.50	71.62	72.87	11,851	18,257
	UCLUST-DeNovo-0.97	0	0	0	0	0	0	0	0	0	0	27,502	18,257
	UCLUST-DeNovo-1.00	0	0	0	0	0	0	0	0	0	0	668,211	18,257
	VSEARCH-DeNovo-0.97	0	0	0	0	0	0	0	0	0	0	9,451	18,257
	VSEARCH-DeNovo-0.99	0	0	0	0	0	0	0	0	0	0	13,050	18,257
	VSEARCH-DeNovo-1.00	0	0	0	0	0	0	0	0	0	0	15,710	18,257
V3V5 (forward)	DADA2-DeNovo-ASV	3.56	5.58	6.00	6.32	6.78	7.48	7.88	8.35	8.75	9.99	97,800	18,269
	UCLUST-ClosedRef-0.97	1.15	5.05	4.00	4.80	6.26	5.35	5.49	5.30	7.00	12.70	23,460	18,269
	UCLUST-ClosedRef-1.00	37.11	35.89	45.40	46.18	58.54	59.81	66.87	63.24	64.86	74.46	11,354	18,269
	UCLUST-DeNovo-0.97	0	0	0	0	0	0	0	0	0	0	28,967	18,269
	UCLUST-DeNovo-1.00	0	0	0	0	0	0	0	0	0	0	1,213,787	18,269
	VSEARCH-DeNovo-0.97	0	0	0	0	0	0	0	0	0	0	6,510	18,269
	VSEARCH-DeNovo-0.99	0	0	0	0	0	0	0	0	0	0	10,512	18,269
	VSEARCH-DeNovo-1.00	0	0	0	0	0	0	0	0	0	0	14,081	18,269
V3V5 (reverse)	DADA2-DeNovo-ASV	3.23	3.95	4.25	4.52	5.06	5.90	6.33	6.94	8.90	10.02	85,124	18,269
	UCLUST-ClosedRef-0.97	1.18	1.60	1.26	1.52	1.26	1.94	2.59	2.92	3.41	12.70	23,739	18,269
	UCLUST-ClosedRef-1.00	13.41	34.26	29.83	35.93	38.65	48.93	54.91	62.75	65.73	74.46	12,542	18,269
	UCLUST-DeNovo-0.97	0	0	0	0	0	0	0	0	0	0	14,924	18,269
	UCLUST-DeNovo-1.00	0	0	0	0	0	0	0	0	0	0	1,010,095	18,269
	VSEARCH-DeNovo-0.97	0	0	0	0	0	0	0	0	0	0	5,518	18,269
	VSEARCH-DeNovo-0.99	0	0	0	0	0	0	0	0	0	0	10,041	18,269

	VSEARCH-DeNovo-1.00	0	0	0	0	0	0	0	0	0	0	14,118	18,269
V4 (forward)	DADA2-DeNovo-ASV	3.12	4.11	4.37	4.70	NA	NA	NA	NA	NA	5.26	42,922	19,971
	UCLUST-ClosedRef-0.97	1.38	2.68	2.08	1.69	NA	NA	NA	NA	NA	3.78	17,463	19,971
	UCLUST-ClosedRef-1.00	30.90	31.06	42.94	37.09	NA	NA	NA	NA	NA	52.47	11,055	19,971
	UCLUST-DeNovo-0.97	0	0	0	0	NA	NA	NA	NA	NA	0	7,602	19,971
	UCLUST-DeNovo-1.00	0	0	0	0	NA	NA	NA	NA	NA	0	439,029	19,971
	VSEARCH-DeNovo-0.97	0	0	0	0	NA	NA	NA	NA	NA	0	5,471	19,971
	VSEARCH-DeNovo-0.99	0	0	0	0	NA	NA	NA	NA	NA	0	8,981	19,971
	VSEARCH-DeNovo-1.00	0	0	0	0	NA	NA	NA	NA	NA	0	11,695	19,971
V4 (reverse)	DADA2-DeNovo-ASV	2.51	3.51	4.05	4.47	NA	NA	NA	NA	NA	5.03	50,898	19,971
	UCLUST-ClosedRef-0.97	0.65	2.64	1.26	1.78	NA	NA	NA	NA	NA	3.78	18,831	19,971
	UCLUST-ClosedRef-1.00	15.54	37.01	42.90	36.59	NA	NA	NA	NA	NA	52.47	11,459	19,971
	UCLUST-DeNovo-0.97	0	0	0	0	NA	NA	NA	NA	NA	0	29,066	19,971
	UCLUST-DeNovo-1.00	0	0	0	0	NA	NA	NA	NA	NA	0	1,130,881	19,971
	VSEARCH-DeNovo-0.97	0	0	0	0	NA	NA	NA	NA	NA	0	4,883	19,971
	VSEARCH-DeNovo-0.99	0	0	0	0	NA	NA	NA	NA	NA	0	8,753	19,971
	VSEARCH-DeNovo-1.00	0	0	0	0	NA	NA	NA	NA	NA	0	11,806	19,971
V6V9 (forward)	DADA2-DeNovo-ASV	3.95	5.13	5.96	6.36	6.68	7.65	7.93	8.29	8.74	10.64	82,525	14,944
	UCLUST-ClosedRef-0.97	3.15	5.83	4.29	4.64	5.05	7.36	5.84	5.11	10.99	12.26	19,707	14,944
	UCLUST-ClosedRef-1.00	20.41	33.85	38.87	40.41	52.04	57.23	67.96	62.79	74.13	84.82	10,100	14,944
	UCLUST-DeNovo-0.97	0	0	0	0	0	0	0	0	0	0	16,744	14,944
	UCLUST-DeNovo-1.00	0	0	0	0	0	0	0	0	0	0	835,026	14,944
	VSEARCH-DeNovo-0.97	0	0	0	0	0	0	0	0	0	0	5,860	14,944
	VSEARCH-DeNovo-0.99	0	0	0	0	0	0	0	0	0	0	9,191	14,944
	VSEARCH-DeNovo-1.00	0	0	0	0	0	0	0	0	0	0	12,038	14,944
V6V9 (reverse)	DADA2-DeNovo-ASV	4.55	5.03	5.23	5.46	6.75	7.01	7.60	8.59	8.92	10.64	73,949	14,944
	UCLUST-ClosedRef-0.97	5.69	8.87	5.03	4.54	8.49	5.80	7.13	7.15	8.27	12.26	16,825	14,944
	UCLUST-ClosedRef-1.00	28.10	46.15	57.64	54.26	62.61	70.05	73.35	80.74	75.96	84.82	8,035	14,944
	UCLUST-DeNovo-0.97	0	0	0	0	0	0	0	0	0	0	12,068	14,944
	UCLUST-DeNovo-1.00	0	0	0	0	0	0	0	0	0	0	1,244,549	14,944
	VSEARCH-DeNovo-0.97	0	0	0	0	0	0	0	0	0	0	5,340	14,944
	VSEARCH-DeNovo-0.99	0	0	0	0	0	0	0	0	0	0	8,849	14,944
	VSEARCH-DeNovo-1.00	0	0	0	0	0	0	0	0	0	0	12,008	14,944

NA, not applicable.