

1 **Supplementary Data**

2 Table S1: Mean SCFA, Ammonium (mmol/L) and SCFA proportions (%) for all nut  
3 types (Almond [Alm] and Macadamia [Mac]) and particle size (F [250-500µm] and CC  
4 [710-1000µm]) at all time removals (0, 4, 8, 12, 15, 21 and 48 h). Total Br Ch is the  
5 sum of the iso-butyric, iso-valeric and valeric acid concentrations. Br Ch Proportions  
6 is the branch chain proportions (proportions of iso-butyric, iso-valeric and valeric acid).  
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Substrates	Mean SCFA (mmol/L)					SCFA proportions (%)				Mean Ammonium (mmol/L)
	Acetate	Propionate	Butyrate	Total Br Ch	Total SCFA	Ac Total	Pr Total	Bu Total	Br Ch Proportion	NH <sub>4</sub> <sup>+</sup>
Mac F 0h	2.42	1.06	0.6	0.22	4.3	56.27	24.65	13.95	5.11	13
Mac F 4h	4.08	1.99	0.98	0.35	7.41	55.06	26.85	13.22	4.72	16.4
Mac F 8h	6.06	2.72	1.32	0.83	10.92	55.49	24.91	12.08	7.6	20.3
Mac F 12h	6.96	3.46	1.36	1.14	12.92	53.86	26.78	10.53	8.82	23.1
Mac F 15h	8.83	4.51	1.6	1.44	16.39	53.88	27.52	9.77	8.79	22.6
Mac F 21h	15.28	8.42	2.22	1.87	27.8	54.97	30.29	7.99	6.73	22.4
Mac F 48h	17.8	11.11	2.82	2.56	34.3	51.9	32.4	8.23	7.47	24.4
Prob Substrate	0.046	0.475	0.054	0.084	0.058	0.045	0.161	0.942	0.705	0.396
HSD	0.791	0.399	0.151	0.152	1.261	1.226	1.773	0.906	0.871	1.508
Mac CC 0h	2.39	0.99	0.57	0.2	4.14	57.73	23.92	13.77	4.84	13
Mac CC 4h	3.52	1.46	0.82	0.25	6.06	58.09	24.1	13.54	4.13	16
Mac CC 8h	6.06	2.2	1.3	0.83	10.41	58.22	21.14	12.49	7.98	21.7
Mac CC 12h	6.96	2.6	1.5	1.18	12.24	56.87	21.25	12.26	9.65	22.7
Mac CC 15h	7.43	2.92	1.6	1.23	13.19	56.34	22.14	12.14	9.33	23.7
Mac CC 21h	8.73	3.97	1.89	1.83	16.44	53.11	24.15	11.5	11.14	25
Mac CC 48h	13.16	9.41	3.03	2.69	28.3	46.51	33.26	10.71	9.51	26
Prob Particle Size (PtSz)	<0.0001	<0.0001	0.6590	0.7909	<0.0001	0.4330	0.013	0.003	0.0124	0.114
HSD PtSz	0.791	0.399	0.151	0.152	1.261	1.226	1.773	0.906	0.871	1.508
Alm F 0h	3	1.35	0.65	0.3	5.15	58.26	26.22	12.63	5.83	11.8
Alm F 4h	4.4	2	0.95	0.3	7.56	58.21	26.46	12.57	3.97	15.4
Alm F 8h	6.69	1.36	1.45	0.96	10.48	63.84	12.98	13.84	9.17	22.4
Alm F 12h	9.35	3.62	1.65	1.33	14.95	62.55	24.22	11.04	8.9	23.3
Alm F 15h	9.88	4.78	1.87	1.53	18.07	54.68	26.46	10.35	8.47	24.6
Alm F 21h	14.02	7.85	2.06	1.84	25.82	54.3	30.41	7.98	7.13	22.1
Alm F 48h	18.33	12.02	3.26	2.78	36.41	50.35	33.02	8.96	7.64	25.6
Prob Time removal	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
HSD	2.377	1.199	0.455	0.458	3.790	3.685	5.331	2.723	2.618	4.584
Alm CC 0h	2.56	1.09	0.69	0.31	4.65	55.06	23.45	14.84	6.67	12.7
Alm CC 4h	4.34	1.75	1.08	0.33	7.5	57.87	23.34	14.4	4.4	16.8
Alm CC 8h	5.96	2.23	1.38	0.63	10.21	58.38	21.85	13.52	6.18	19.1
Alm CC 12h	8.65	3.03	1.83	1.33	14.84	58.29	20.42	12.34	8.97	24.7
Alm CC 15h	9.08	3.17	1.87	1.47	15.58	58.28	20.35	12.01	9.44	25.4
Alm CC 21h	11.96	5.3	1.17	2.46	20.89	57.26	25.38	5.61	11.78	26.4
Alm CC 48h	14.04	9	3.24	2.82	29.11	48.24	30.92	11.14	9.69	27.7

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9 Table S2: Analysis of Variance for all variants of Nut type, Particle size and Time  
 10 removal for all SCFA proportions and ammonia (NH<sub>3</sub>). <sup>a,b</sup>- All superscripts represent  
 11 Tukey's grouping where different letters (groupings) represent significant differences  
 12 between each variant (the different nut types, particle sizes or time removal).

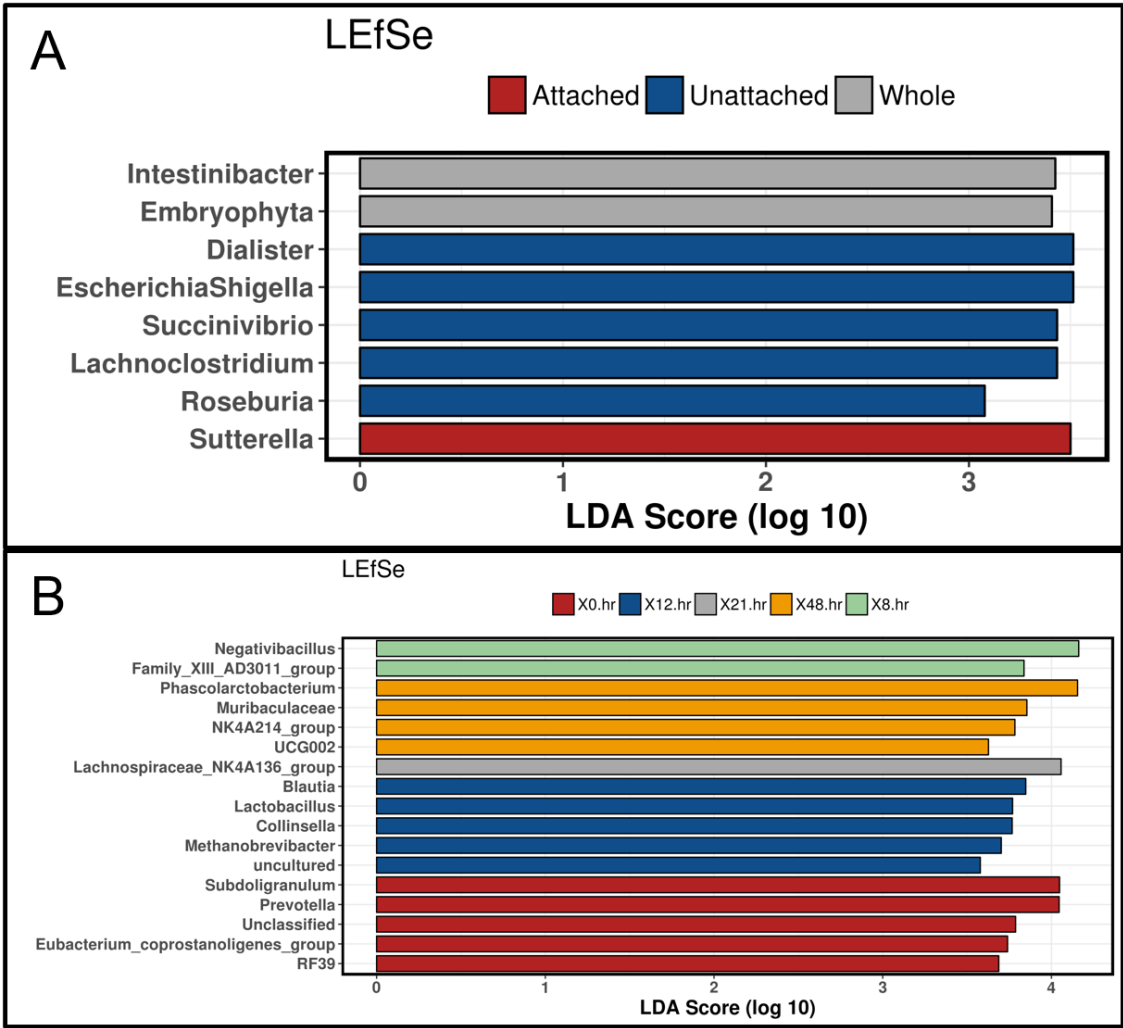
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	Variant (n)	Acetate (%)	Propionate (%)	Butyrate (%)	Br Ch (%)	Total SCFA	NH3
<b>Nut Type</b>							
Almond	34	55.136 <sup>a</sup>	27.181 <sup>a</sup>	11.249 <sup>a</sup>	0.229 <sup>a</sup>	3.233 <sup>a</sup>	3.819 <sup>a</sup>
Macadamia	34	55.880 <sup>b</sup>	25.923 <sup>a</sup>	11.216 <sup>a</sup>	0.229 <sup>a</sup>	3.076 <sup>b</sup>	3.771 <sup>a</sup>
<i>P-value</i>		0.012	0.065	0.787	0.932	0.011	0.258
<i>MSD</i>		1.090	1.354	0.586	0.015	0.112	0.084
<b>Particle Size</b>							
CC (710-1000 μm)	34	54.266 <sup>a</sup>	25.422 <sup>a</sup>	11.932 <sup>a</sup>	0.244 <sup>a</sup>	2.888 <sup>a</sup>	3.939 <sup>a</sup>
F (250-500μm)	34	54.750 <sup>a</sup>	27.682 <sup>b</sup>	10.534 <sup>b</sup>	0.215 <sup>b</sup>	3.421 <sup>b</sup>	3.646 <sup>b</sup>
<i>P-value</i>		0.375	0.001	<0.0001	0.003	<0.0001	<0.0001
<i>MSD</i>		1.090	1.354	0.586	0.015	0.112	0.084
<b>Removal Time</b>							
0 h	8	56.813 <sup>ab</sup>	24.545 <sup>bc</sup>	13.764 <sup>a</sup>	0.0590 <sup>a</sup>	0.792 <sup>a</sup>	2.189 <sup>a</sup>
6 h	8	57.286 <sup>ab</sup>	25.160 <sup>bc</sup>	13.422 <sup>a</sup>	0.0451 <sup>a</sup>	1.246 <sup>b</sup>	2.823 <sup>b</sup>
12 h	8	59.138 <sup>a</sup>	20.106 <sup>d</sup>	13.026 <sup>ab</sup>	0.271 <sup>b</sup>	1.823 <sup>c</sup>	3.614 <sup>c</sup>
18 h	8	56.242 <sup>ab</sup>	23.160 <sup>cd</sup>	11.545 <sup>bc</sup>	0.330 <sup>c</sup>	2.375 <sup>d</sup>	4.052 <sup>d</sup>
24 h	8	55.805 <sup>b</sup>	24.114 <sup>bcd</sup>	11.064 <sup>cd</sup>	0.318 <sup>cd</sup>	2.739 <sup>e</sup>	4.180 <sup>d</sup>
48 h	20	49.242 <sup>c</sup>	32.409 <sup>a</sup>	9.760 <sup>d</sup>	0.260 <sup>b</sup>	5.541 <sup>f</sup>	4.498 <sup>e</sup>
<i>P-Value</i>		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
<i>MSD</i>		3.299	4.098	1.773	0.046	0.340	0.255

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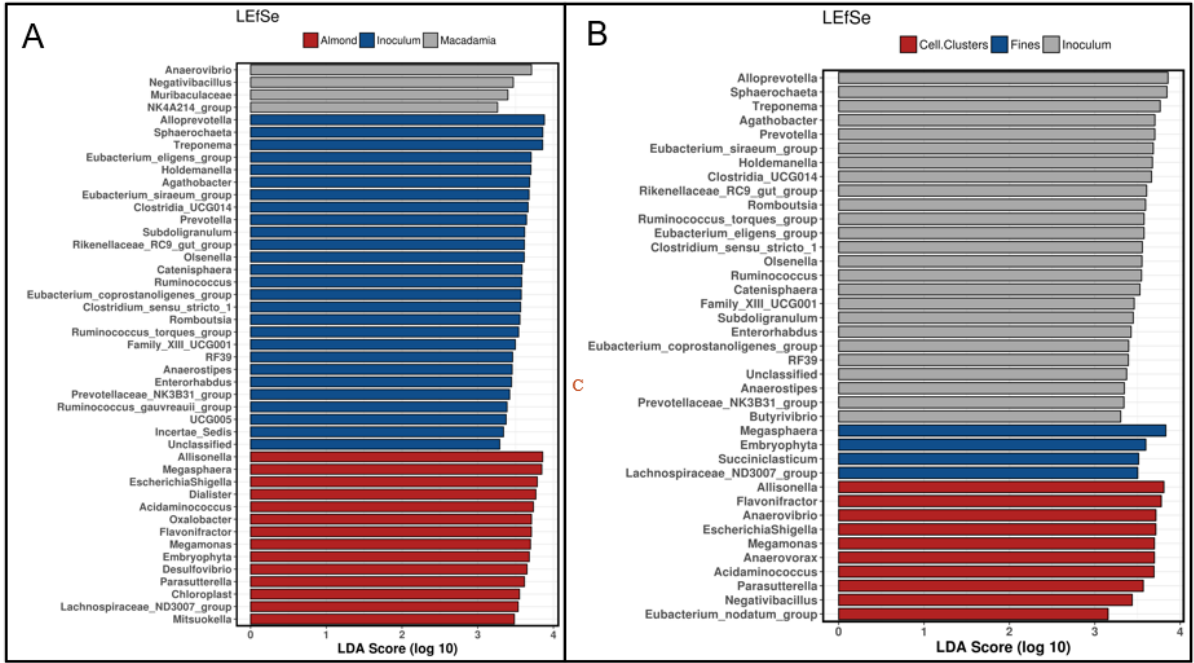
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18 Figure S1: Linear discriminant analysis effect size (LEfSe) analysis of microbial  
 19 biomass attachment for the top 100 genus present (A), and the LEfSe analysis of  
 20 Time removals for the top 20 genera present (B).

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23 Figure S2: LEfSe analysis of different nuts (and inoculum) for the top 100 genera(A),  
 24 and the LEfSe analysis of particle size for the top 100 genera (B).

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