

Supporting information S3A: Determining the maintenance calculation for *P. pastoris*

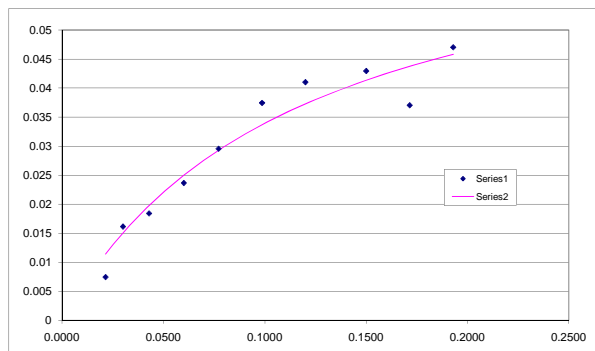
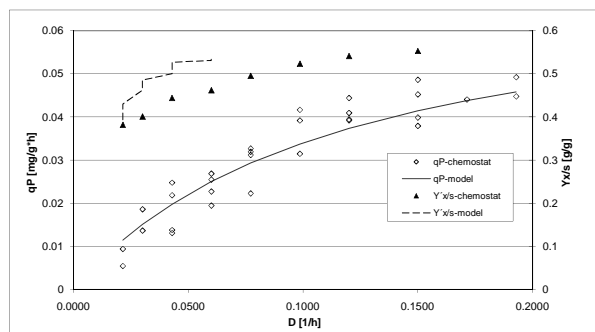
time	Wrate	biomass	product	biomass X	q	P	dt	qmax	0.0734978	productiv	yield	coefficient	feed	feed/minute
t	mu													
0	0.15	15.6958397	0	2.33300472	0.04137	0.64940797	21	0.1153969	0.5727241	0.534114553	1.79387741	0.07324666		
0.4072	0.159	16.6539757	0.264246743	2.64161009	0.04239	0.70597242		0.01083397	0.53609691	2.0063811	0.08212482			
0.8144	0.145	17.7295898	0.55188547	2.56978751	0.04075	0.72248611		0.02224057	0.53285555	1.96232808	0.08032157			
1.2215	0.135	18.7752261	0.846086259	2.52661433	0.03941	0.73993543		0.03354546	0.530339642	1.94096795	0.07944734			
1.6287	0.128	19.8041611	1.147356281	2.50351031	0.03805	0.76376324		0.044766326	0.529152919	1.94065816	0.08025334			
2.0359	0.124	20.8395439	1.458241911	2.57563062	0.03785	0.78879496		0.05600888	0.528553808	1.99172138	0.08152477			
2.4431	0.117	21.8882924	1.779424219	2.55343685	0.03679	0.80527054		0.06729261	0.524042123	1.98402292	0.08120966			
2.8503	0.111	22.928004	2.107315475	2.55262642	0.03593	0.82384006		0.07848396	0.52192006	1.99145745	0.08151397			
3.2574	0.107	23.9673856	2.442767691	2.5653417	0.03521	0.84386879		0.08961835	0.520067761	2.0085056	0.08221178			
3.6646	0.103	25.0119446	2.786375232	2.56472844	0.03442	0.86208665		0.10071977	0.517980338	2.01611766	0.08255235			
4.0718	0.098	26.0562539	3.136952845	2.55456926	0.0336	0.8755691		0.11174743	0.515717733	2.01693396	0.08255677			
4.479	0.095	27.0964225	3.493468156	2.56583275	0.03297	0.89337921		0.12266824	0.513909448	2.03296313	0.08321287			
4.8862	0.093	28.1411815	3.857235412	2.63108228	0.03274	0.92132187		0.13353223	0.513234744	2.08740222	0.08544116			
5.2934	0.09	29.2125098	4.232380394	2.63993585	0.03212	0.93933685		0.1444826	0.511397434	2.10519501	0.08603667			
5.7005	0.088	30.2874412	4.614477986	2.6688742	0.03167	0.95908816		0.15536682	0.509997672	2.13066477	0.08721197			
6.1077	0.086	31.3740752	5.005000693	2.69912713	0.03124	0.98000513		0.16623646	0.508650069	2.16068767	0.08844086			
6.5149	0.08	32.4731092	5.404040396	2.63040249	0.02998	0.97342601		0.17709514	0.504524728	2.1010995	0.08600181			
6.9221	0.079	33.5331658	5.800401207	2.6632732	0.02981	0.99962075		0.1875812	0.503958815	2.15183235	0.0880784			
7.3293	0.077	34.6176007	6.207428923	2.68269732	0.02938	1.01911106		0.19813515	0.502458091	2.17377599	0.08898096			
7.7364	0.076	35.7099325	6.62149513	2.69687149	0.02892	1.03280346		0.20864011	0.50085298	2.19249068	0.08974262			
8.1436	0.074	36.808048	7.042033235	2.71305699	0.0285	1.04891263		0.21908205	0.499311469	2.21245851	0.09055994			
8.5508	0.072	37.9127539	7.469130868	2.73175465	0.0281	1.06541407		0.2294607	0.497846115	2.23426318	0.09145244			
8.958	0.072	39.0250732	7.902947492	2.750163842	0.02798	1.08197751		0.23976804	0.497373888	2.26540088	0.09235456			
9.3652	0.069	40.1617719	8.347497831	2.75342284	0.02724	1.09415955		0.25018599	0.494549586	2.26696939	0.09279227			
9.7723	0.067	41.282914	8.793019071	2.771671607	0.02692	1.11149103		0.26036148	0.493277776	2.29279699	0.09385571			
10.18	0.066	42.4139886	9.245597367	2.781914314	0.02649	1.12352275		0.270501	0.491513961	2.30462579	0.09433251			
10.587	0.065	43.5467346	9.703074755	2.83337657	0.02635	1.14760574		0.28054343	0.49051892	2.34992024	0.0961865			
10.994	0.064	44.7040414	10.17038929	2.8651081	0.02605	1.16433078		0.29063237	0.489498929	2.39722356	0.09772356			
11.401	0.063	45.863559	10.64446266	2.89914881	0.02587	1.18635814		0.30068275	0.488905965	2.41453181	0.09883171			
11.808	0.06	47.0440381	11.12755544	2.84821914	0.02512	1.18164833		0.31075391	0.485634787	2.38365231	0.09756721			
12.215	0.06	48.2016225	11.60870047	2.89740861	0.02503	1.20648489		0.32054564	0.485240888	2.43130878	0.09951788			
12.623	0.059	49.361363	12.0995849	2.9276255	0.0248	1.22479378		0.33039579	0.484213357	2.46190069	0.10077006			
13.03	0.057	50.5734782	12.59867153	2.93850581	0.02422	1.22496004		0.34023062	0.481517553	2.44680859	0.10015231			
13.437	0.057	51.7516594	13.09745228	2.92679424	0.02403	1.24377597		0.34985333	0.480625269	2.4795275	0.10148259			
13.844	0.056	52.9433952	13.60389452	2.94487122	0.02377	1.25823533		0.35947141	0.479334305	2.50158669	0.10239448			
14.251	0.055	54.1424915	14.11622434	2.93938662	0.02354	1.27451349		0.36903866	0.4782294	2.52833129	0.10348919			
14.659	0.054	55.3516138	14.63518232	2.9408574	0.02327	1.28780365		0.37857581	0.476866538	2.54802115	0.10426513			
15.066	0.053	56.566776	15.15995182	3.00700885	0.02304	1.30345776		0.38805268	0.475738047	2.57368021	0.1053454			
15.473	0.052	57.7910752	15.69029537	3.03233773	0.02284	1.31979219		0.39749551	0.474648095	2.60112157	0.1064862			
15.88	0.052	59.0257862	16.22768999	3.04757138	0.02259	1.33310411		0.40691229	0.473371395	2.62715931	0.10730656			
16.287	0.051	60.2667731	16.77054917	3.06517457	0.02225	1.34693036		0.41627337	0.472124795	2.64354417	0.10820496			
16.694	0.05	61.514585	17.3184898	3.08343631	0.02212	1.36039613		0.42558526	0.47091184	2.66614112	0.10912999			
17.102	0.049	62.7703724	17.87309746	3.10251531	0.02191	1.37512635		0.4348515	0.469731523	2.6893877	0.11008115			
17.509	0.049	64.0332614	18.43302311	3.11883055	0.02168	1.38838873		0.44407514	0.468485684	2.71071156	0.11095434			
17.916	0.048	65.3035877	18.99834896	3.13698985	0.02147	1.40211694		0.45324841	0.467297648	2.73332117	0.11187979			
18.323	0.047	66.5808223	19.56925467	3.15450128	0.02128	1.41685958		0.46237726	0.466197551	2.75800323	0.11289007			
18.73	0.047	67.8666366	20.14611247	3.18018471	0.0211	1.43171605		0.47147095	0.465149046	2.78386372	0.11394859			
19.138	0.046	69.1615482	20.72908039	3.18415257	0.02083	1.44073869		0.48053484	0.46359816	2.79666164	0.11447243			
19.545	0.045	70.4580754	21.31572215	3.20164021	0.02064	1.45401307		0.48951359	0.462436678	2.81908398	0.11539022			
19.952	0.045	71.7614573	21.9077879	3.21954962	0.02045	1.46782636		0.49844895	0.461254949	2.84335258	0.11639766			
20.359	0.044	73.0763757	22.50647413	3.24675992	0.02023	1.48377022		0.50730738	0.460419822	2.86713554	0.11752897			
20.766	0.044	74.3983654	23.11063753	3.25634069	0.02008	1.49428753		0.51625144	0.459060979	2.88833271	0.1182247			
21.173	0.043	75.7243162	23.71908338	3.28443377	0.01995	1.51090897		0.5250672	0.458231956	2.9185215	0.11946038			
21.581	0.043	77.061676	24.34249717	3.303279787	0.01978	1.52426458		0.53387393	0.457135103	2.94418856	0.12041655			
21.988	0.042	78.4065134	24.95494911	3.32195311	0.01961	1.53717722		0.54264297	0.45601381	2.96446432	0.1213409			
22.395	0.042	79.75835	25.58085883	3.3373629	0.01943	1.55010299		0.5513741	0.454906464	2.98732922	0.12227286			
22.802	0.041	81.1172616	26.21203169	3.35881757	0.01929	1.56343622		0.56004062	0.453922111	3.01295629	0.12323577			
23.209	0.041	82.4849091	26.84901919	3.37644379	0.01911	1.57669697		0.56877272	0.452786467	3.03745539	0.12421763			
23.617	0.04	83.8559078	27.49103082	3.39511982	0.01896	1.59021035		0.577421172	0.451742192	3.05929514	0.12522366			
24.024	0.04	85.2410634	28.1358448	3.41400114	0.01882	1.60386517		0.58593046	0.4507569	3.08396216	0.12623162			
24.431	0.04	86.6311806	28.79160861	3.42915048	0.01865	1.61581372		0.59448872	0.449625281	3.10544315	0.12711142			
24.838	0.039	88.0274664	29.44953765	3.44926521	0.01851	1.62955611		0.60303089	0.44849836	3.13068761	0.12814472			
25.245	0.039	89.4532049	30.11306232	3.46816343	0.01837	1.64257795		0.61149168	0.447331922	3.15579597	0.12913003			
25.652	0.038	90.8447238	30.78182182	3.48502193	0.01822	1.65511798		0.61994809	0.446252922	3.17767495	0.130068			
26.06	0.038	92.2632838	31.45585482	3.50398491	0.01808	1.66824386		0.62836809	0.445577349	3.20204096	0.13106534			
26.467	0.038	93.6900407	32.13513242	3.52714707	0.01796	1.68288105		0.63675812	0.444708986	3.229501	0.13218933			
26.874	0.037	95.122228	32.82037002	3.55730982	0.01778	1.69829016		0.645131	0.44378597	3.24779108	0.13293798			
27.281	0.037	96.5652579	33.50964707	3.58949624	0.01769	1.70692654		0.65349854	0.442852279	3.27433502	0.13394247			
27.688	0.037	98.0157748	34.20464498	3.5792923	0.01755	1.71937348		0.66174808	0.441617039	3.2989287	0.13503114			
28.096	0.036	99.4725902	34.90494969	3.59711457	0.01742	1.73297143		0.67001845	0.440636631	3.3				

59.041	0.05	385.897793	161.6384742	19.2948896	0.02209	8.52258545
59.448	0.05	383.75431	165.1087111	19.8877155	0.02209	8.69609729
59.856	0.05	401.7170778	168.6465987	20.0885389	0.02209	8.87314168
60.263	0.05	409.950454	172.2625756	20.4975227	0.02209	9.05379052
60.67	0.05	418.296661	175.9491092	20.9148331	0.02209	9.2381172
61.077	0.05	426.812789	179.7106973	21.3406394	0.02209	9.4261966
61.484	0.05	435.502287	183.5488677	21.7751148	0.02209	9.61810512
61.892	0.05	444.368715	187.4651796	22.2184358	0.02209	9.81302072
62.299	0.05	453.415645	191.4612241	22.6707823	0.02209	10.01372229
62.706	0.05	462.646763	195.5386242	23.1323381	0.02209	10.2175929
63.113	0.05	472.065817	199.6990364	23.6032908	0.02209	10.4256136
63.52	0.05	481.678654	203.9441506	24.0835317	0.02209	10.6378893
63.927	0.05	491.483118	208.2756914	24.5741559	0.02209	10.8544463
64.335	0.05	501.489254	212.6954183	25.0744627	0.02209	11.0754327
64.742	0.05	511.699104	217.2051267	25.5849552	0.02209	11.3009181
65.149	0.05	522.116918	221.8068486	26.1058409	0.02209	11.5308942
65.556	0.05	532.746627	226.5018531	26.6373313	0.02209	11.7657544
65.963	0.05	543.592849	231.2926475	27.1796424	0.02209	12.0052941
66.371	0.05	554.659889	236.1809781	27.7329945	0.02209	12.2497106
66.778	0.05	565.952244	241.1688305	28.2976122	0.02209	12.4991033
67.185	0.05	577.474501	246.2582308	28.8737225	0.02209	12.7535733
67.592	0.05	589.23134	251.4512466	29.461567	0.02209	13.0132241
67.999	0.05	601.227537	256.7499873	30.0613769	0.02209	13.2781611
68.406	0.05	613.467966	262.1566054	30.6733983	0.02209	13.5484892
68.814	0.05	625.957599	267.6732972	31.2978789	0.02209	13.8243266
69.221	0.05	638.701508	273.3023037	31.9350754	0.02209	14.1057769
69.628	0.05	651.704872	279.0459114	32.5852436	0.02209	14.3929573
70.035	0.05	664.972972	284.9064536	33.2486486	0.02209	14.6859844
70.442	0.05	678.511198	290.886311	33.9255599	0.02209	14.9849773
70.85	0.05	692.325049	296.9879126	34.6162525	0.02209	15.2900574
71.257	0.05	706.420138	303.2137371	35.3210069	0.02209	15.6013486
71.664	0.05	720.802189	309.5663136	36.0401095	0.02209	15.9189774
72.071	0.05	735.477046	316.0482225	36.7738523	0.02209	16.2430729
72.478	0.05	750.450668	322.8628971	37.5225334	0.02209	16.5737666
72.885	0.05	765.729114	329.4106239	38.288457	0.02209	16.9111929
73.293	0.05	781.318667	336.2965444	39.0659334	0.02209	17.255488
73.7	0.05	797.225582	343.3226558	39.8612791	0.02209	17.6067945
74.107	0.05	813.456347	350.4918123	40.6728174	0.02209	17.9652524
74.514	0.05	830.017556	357.806926	41.5008778	0.02209	18.331308
74.921	0.05	846.915934	365.2709686	42.3457967	0.02209	18.7042102
75.329	0.05	864.158348	372.8869721	43.2079174	0.02209	19.0850103
75.736	0.05	881.751802	380.6590303	44.0875901	0.02209	19.4735633
76.143	0.05	899.703441	388.5872999	44.9851721	0.02209	19.8700267
76.55	0.05	918.02056	396.678002	45.901028	0.02209	20.2745618
76.957	0.05	936.710597	404.934233	46.8355299	0.02209	20.6873329
77.364	0.05	955.781146	413.3569171	47.7890573	0.02209	21.1085076
77.772	0.05	975.239564	421.9519054	48.7619977	0.02209	21.538257
78.179	0.05	995.084925	430.7218796	49.7547462	0.02209	21.9767557
78.586	0.05	1015.35412	439.6704023	50.7677062	0.02209	22.4241819
78.993	0.05	1036.02578	448.8011085	51.8012891	0.02209	22.8807172
79.4	0.05	1057.11829	458.1177073	52.8559147	0.02209	23.3465471
79.808	0.05	1078.64023	467.6238633	53.9320116	0.02209	23.8218608
80.215	0.05	1100.60033	477.3237981	55.030167	0.02209	24.308516
80.622	0.05	1123.00753	487.2210921	56.1503763	0.02209	24.8017163
81.029	0.05	1145.87091	497.3198857	57.2935453	0.02209	25.306656
81.436	0.05	1169.19976	507.6242813	58.4599881	0.02209	25.8218758
81.843	0.05	1193.03357	518.1384647	59.6501785	0.02209	26.347595
82.251	0.05	1217.29201	528.8667071	60.8646003	0.02209	26.8839971
82.658	0.05	1242.07493	539.8133663	62.1037465	0.02209	27.4313301
83.065	0.05	1267.36241	550.9828893	63.3681205	0.02209	27.9898062
83.472	0.05	1293.16472	562.3788133	64.6582236	0.02209	28.5595524
83.879	0.05	1319.49234	574.008768	65.974617	0.02209	29.1411001
84.287	0.05	1346.35597	585.8744773	67.3177984	0.02209	29.7343856
84.694	0.05	1373.76651	597.9817613	68.6883256	0.02209	30.3397498
85.101	0.05	1401.73511	610.3355383	70.0867555	0.02209	30.9574387
85.508	0.05	1430.27312	622.9406265	71.5138561	0.02209	31.5877031
85.915	0.05	1459.39214	635.8027466	72.969607	0.02209	32.2307991
86.322	0.05	1489.1104	648.9265234	74.4551998	0.02209	32.8898979
86.73	0.05	1519.42076	662.3174879	75.9710378	0.02209	33.5655361
87.137	0.05	1550.35474	675.3810789	77.5177369	0.02209	34.24297157
87.544	0.05	1581.91851	689.9228498	79.0955253	0.02209	34.9380042
87.951	0.05	1614.12488	704.1484611	80.7062441	0.02209	35.6480848
88.358	0.05	1646.98695	718.6636925	82.3493476	0.02209	36.3738464
88.766	0.05	1680.51806	733.4744403	84.025903	0.02209	37.1143838
89.173	0.05	1714.73183	748.5867211	85.7365915	0.02209	37.8699978
89.58	0.05	1749.64216	764.0066738	87.4821082	0.02209	38.6409954
89.987	0.05	1785.26324	779.7405622	89.2631619	0.02209	39.4276899
90.394	0.05	1821.69952	795.7947779	91.0804761	0.02209	40.2304006
90.801	0.05	1858.89578	812.1758423	92.9347892	0.02209	41.0494538
91.209	0.05	1896.53709	828.8904099	94.8265543	0.02209	41.8851822
91.616	0.05	1935.1488	845.9452703	96.7574401	0.02209	42.7379253
92.023	0.05	1974.54662	863.3473517	98.7273308	0.02209	43.6080293
92.43	0.05	2014.74653	881.1037232	100.737327	0.02209	44.4959478
92.837	0.05	2055.76488	899.2215977	102.788244	0.02209	45.4017416
93.245	0.05	2097.61833	917.7083352	104.880916	0.02209	46.3260785
93.652	0.05	2140.32387	936.5714452	107.016193	0.02209	47.269234
94.059	0.05	2183.89886	955.8185906	109.194943	0.02209	48.2315913
94.466	0.05	2228.36099	975.4575897	111.418949	0.02209	49.2135412
94.873	0.05	2273.72833	995.4964205	113.686416	0.02209	50.2154828
95.28	0.05	2320.0193	1015.943223	116.000965	0.02209	51.2378229
95.688	0.05	2367.25272	1036.806303	118.362636	0.02209	52.2809769
96.095	0.05	2415.44777	1058.094136	120.772388	0.02209	53.3463686
96.502	0.05	2464.62402	1079.81537	123.231201	0.02209	54.4314302
96.909	0.05	2514.80145	1101.978827	125.740072	0.02209	55.5396031
97.316	0.05	2566.00045	1124.593511	128.300022	0.02209	56.6703373
97.723	0.05	2618.24811	1147.668681	130.912091	0.02209	57.8240462
98.131	0.05	2671.54676	1171.213495	133.577338	0.02209	59.0013365
98.538	0.05	2725.93694	1195.237733	136.296847	0.02209	60.2025484
98.945	0.05	2781.43446	1219.751081	139.071723	0.02209	61.4282158
99.352	0.05	2838.06186	1244.763498	141.903093	0.02209	62.6788366
99.759	0.05	2895.84214	1270.285144	144.792107	0.02209	63.954919
100.17	0.05	2954.79877	1296.326386	147.739938	0.02209	65.2569811
100.57	0.05	3014.9557	1322.897806	150.747785	0.02209	66.585552
100.98	0.05	3076.33737	1350.010194	153.816868	0.02209	67.9411714
101.39	0.05	3138.96871	1377.674564	156.948436	0.02209	69.3243899
101.8	0.05	3202.87517	1405.902155	160.143758	0.02209	70.7367695
102.2	0.05	3268.0827	1434.704434	163.404135	0.02209	72.1758834
102.61	0.05	3334.6178	1464.993099	166.73089	0.02209	73.6453167
103.02	0.05	3402.50749	1494.080091	170.125375	0.02209	75.1466663
103.42	0.05	3471.77935	1524.677589	173.588968	0.02209	76.6745412
103.83	0.05	3542.46153	1555.889624	177.123076	0.02209	78.2355629
104.24	0.05	3614.58272	1587.754077	180.729136	0.02209	79.8283656
104.65	0.05	3688.17223	1620.25869	184.408612	0.02209	81.4535963
105.05	0.05	3763.25996	1653.425067	188.162998	0.02209	83.1119151
105.46	0.05	3839.8764	1687.266679	191.99382	0.02209	84.8039597
105.87	0.05	3918.05298	1721.797275	195.902634	0.02209	86.5305265
106.27	0.05	3997.82056	1757.030882	199.891028	0.02209	88.2922058
106.68	0.05	4079.21244	1792.981812	203.960622	0.02209	90.0897523
107.09	0.05	4162.26138	1829.664669	208.113069	0.02209	91.9238952
107.5	0.05	4247.00112	1867.094355	212.350056	0.02209	93.7953795
107.9	0.05	4333.46607	1905.286074	216.673304	0.02209	95.7049654
108.31	0.05	4421.69138	1944.25534	221.084569	0.02209	97.6534287
108.72	0.05	4511.71287	1984.017984	225.585643	0.02209	99.641561
109.12	0.05	4603.56711	2024.590159	230.178356	0.02209	101.67017
109.53	0.05	4697.29142	2065.988344	234.864571	0.02209	103.740079
109.94	0.05	4792.92387	2108.229359	239.646193	0.02209	105.85213
110.35	0.05	4890.5033	2151.33036	244.525165	0.02209	108.00718
110.76	0.05	4980.06936	2195.308957	249.503468	0.02209	110.206105

119.71 0.05 7774.51224 3425.201996 388.725612 0.02209 171.700762
120.12 0.05 7932.79402 3495.115325 396.639701 0.02209 175.196428
120.53 0.05 8094.29626 3566.452024 404.714913 0.02209 178.763263
120.93 0.05 8259.09058 3630.241071 412.954529 0.02209 182.402715
121.34 0.05 8427.23792 3713.512035 421.361896 0.02209 186.116263
121.75 0.05 8598.80858 3789.259086 429.940429 0.02209 189.905416
122.15 0.05 8773.87226 3866.621009 438.693613 0.02209 193.771712
122.56 0.05 8952.50007 3945.521215 447.625003 0.02209 197.716722
122.97 0.05 9134.76457 4026.027755 456.738229 0.02209 201.74205
123.38 0.05 9320.73981 4108.173333 466.03699 0.02209 205.849328
123.78 0.05 9510.50133 4191.991318 475.525066 0.02209 210.040228
124.19 0.05 9704.12621 4277.515758 485.205311 0.02209 214.31545
124.6 0.05 9901.69312 4364.781396 495.084656 0.02209 218.679732
125 0.05 10103.2823 4453.82368 505.164115 0.02209 223.131846
125.41 0.05 10308.9757 4544.678782 515.448783 0.02209 227.674601
125.82 0.05 10518.8567 4637.383608 525.942837 0.02209 232.308942
126.23 0.05 10733.0108 4731.975818 536.650539 0.02209 237.039453
126.63 0.05 10951.5248 4828.493836 547.576241 0.02209 241.865354
127.04 0.05 11174.4876 4926.976871 558.72438 0.02209 246.789505
127.45 0.05 11401.9897 5027.464928 570.099484 0.02209 251.813908
127.85 0.05 11634.1225 5129.998827 581.705175 0.02209 256.940603
128.26 0.05 11870.9833 5234.620221 593.549167 0.02209 262.171673
128.67 0.05 12112.6654 5341.371607 605.633271 0.02209 267.509242
129.08 0.05 12359.2679 5450.296352 617.963396 0.02209 272.955479
129.48 0.05 12610.891 5561.438703 630.544551 0.02209 278.512597
129.89 0.05 12867.6369 5674.843808 643.381947 0.02209 284.182652
130.3 0.05 13129.61 5790.557734 656.480498 0.02209 289.968548
130.71 0.05 13396.9165 5908.627487 669.845825 0.02209 295.872036
131.11 0.05 13669.6652 6029.101029 683.483258 0.02209 301.895713
131.52 0.05 13947.9667 6152.0273 697.398336 0.02209 308.042027
131.93 0.05 14231.9342 6277.456235 711.596712 0.02209 314.313473
132.33 0.05 14521.6831 6405.438785 726.084153 0.02209 320.712601
132.74 0.05 14817.3309 6536.026939 740.866546 0.02209 327.242009
133.15 0.05 15118.9979 6669.273746 755.949894 0.02209 333.904349
133.56 0.05 15426.8065 6805.233333 771.340324 0.02209 340.702328
133.96 0.05 15740.8818 6943.96093 787.04409 0.02209 347.638708
134.37 0.05 16061.3514 7085.51289 803.067569 0.02209 354.716306
134.78 0.05 16388.3454 7229.946716 819.417272 0.02209 361.937998
135.18 0.05 16721.9968 7377.321076 836.099639 0.02209 369.308716
135.59 0.05 17062.4409 7527.695845 853.122047 0.02209 376.825454
136 0.05 17409.8162 7681.1321 870.490812 0.02209 384.497267
136.41 0.05 17764.2638 7837.692174 888.213188 0.02209 392.32527
136.81 0.05 18125.9275 7997.438965 906.296376 0.02209 400.312645
137.22 0.05 18494.9544 8160.439464 924.74772 0.02209 408.462635
137.63 0.05 18871.4943 8326.757786 943.574716 0.02209 416.778551
138.03 0.05 19255.7002 8496.462193 962.785012 0.02209 425.263771
138.44 0.05 19647.7282 8669.621623 982.386412 0.02209 433.921743
138.85 0.05 20047.7376 8846.305417 1002.38689 0.02209 442.755983
139.26 0.05 20455.8907 9026.588347 1022.79453 0.02209 451.770079
139.66 0.05 20872.3534 9210.540648 1043.61767 0.02209 460.967694
140.07 0.05 21297.295 9398.238045 1064.86475 0.02209 470.352564
140.48 0.05 21730.8879 9588.756785 1086.5444 0.02209 479.828501
140.88 0.05 22173.3094 9785.174668 1108.66542 0.02209 489.699595
141.29 0.05 22624.7362 9984.571075 1131.23681 0.02209 499.669215
141.7 0.05 23085.3546 10188.02701 1154.26773 0.02209 509.842012
142.11 0.05 23565.3508 10395.62511 1177.76754 0.02209 520.221917
142.51 0.05 24034.9156 10607.44971 1201.74579 0.02209 530.813147
142.92 0.05 24524.2439 10823.58687 1226.2122 0.02209 541.620005
143.33 0.05 25023.5345 11044.12437 1251.17673 0.02209 552.64688
143.73 0.05 25532.9902 11269.15182 1276.64951 0.02209 563.898253
144.14 0.05 26052.818 11498.78061 1302.84909 0.02209 575.378692
144.55 0.05 26583.2289 11733.04402 1329.16144 0.02209 587.929263
144.96 0.05 27124.4385 11972.09722 1356.22193 0.02209 599.045523
145.36 0.05 27676.6666 12216.01731 1383.83333 0.02209 611.241527
145.77 0.05 28240.1376 12464.9034 1412.00688 0.02209 623.885832
146.18 0.05 28815.0803 12718.85657 1440.75402 0.02209 636.38249
146.59 0.05 29401.7283 12977.97999 1470.08642 0.02209 649.339661
146.99 0.05 30000.3199 13242.37892 1500.016 0.02209 662.599608
147.4 0.05 30611.0983 13512.16076 1530.55492 0.02209 676.0487
147.81 0.05 31234.3116 13787.43511 1561.71558 0.02209 689.812417
148.21 0.05 31870.2128 14068.31378 1593.51064 0.02209 703.86351
148.62 0.05 32519.0605 14354.91088 1625.95302 0.02209 718.186206
149.03 0.05 33181.118 14647.34283 1659.0559 0.02209 732.807803
149.44 0.05 33856.6545 14945.72842 1692.83272 0.02209 747.727083
149.84 0.05 34545.9442 15250.18886 1727.27271 0.02209 762.950105
150.25 0.05 35249.2672 15560.84783 1762.46336 0.02209 778.483053
150.66 0.05 35966.9093 15877.83153 1798.34546 0.02209 794.322238
151.06 0.05 36699.1618 16201.26872 1834.95809 0.02209 810.504097
151.47 0.05 37446.3223 16531.28078 1872.31611 0.02209 827.005201
151.88 0.05 38208.6943 16868.03178 1910.43471 0.02209 843.942251
152.29 0.05 38986.5875 17211.62852 1949.32937 0.02209 861.022088
152.69 0.05 39780.3178 17562.22056 1989.01589 0.02209 878.55169
153.1 0.05 40590.2078 17919.95032 2029.51039 0.02209 896.438178
153.51 0.05 41416.5863 18284.96313 2070.82932 0.02209 914.688818
153.91 0.05 42259.7892 18657.40726 2112.98946 0.02209 933.311025
154.32 0.05 43120.1589 19037.434 2156.00794 0.02209 952.312362
154.73 0.05 43998.0448 19425.19773 2194.90224 0.02209 971.700548
155.14 0.05 44893.8038 19820.85596 2244.69010 0.02209 991.48346
155.54 0.05 45807.7995 20224.56943 2290.38967 0.02209 1011.66913
155.95 0.05 46740.4033 20636.50212 2337.02017 0.02209 1032.26577
156.36 0.05 47691.9941 21056.82138 2384.5997 0.02209 1053.28173
156.76 0.05 48662.9584 21485.69794 2433.14792 0.02209 1074.72556
157.17 0.05 49653.6906 21923.30602 2482.69453 0.02209 1096.60596
157.58 0.05 50664.5931 22369.8234 2533.22966 0.02209 1118.93183
157.99 0.05 51696.0767 22825.43145 2584.80384 0.02209 1141.71223
158.39 0.05 52748.5603 23290.31525 2637.42802 0.02209 1164.95642
158.8 0.05 53822.4716 23764.86386 2691.12358 0.02209 1188.67384
159.21 0.05 54918.2466 24248.66935 2745.91233 0.02209 1212.87413
159.62 0.05 56036.3306 24742.52894 2801.81653 0.02209 1237.56711
160.02 0.05 57177.1777 25246.44305 2858.85889 0.02209 1262.76281
160.43 0.05 58341.2514 25760.61638 2917.06257 0.02209 1288.47148
160.84 0.05 59529.0246 26285.25779 2976.45123 0.02209 1314.70355
161.24 0.05 60740.9797 26820.58041 3037.04998 0.02209 1341.46968
161.65 0.05 61977.609 27366.8017 3098.88045 0.02209 1368.78075
162.06 0.05 63239.415 27924.14354 3161.97075 0.02209 1396.64784
162.47 0.05 64526.9102 28492.83234 3226.34551 0.02209 1425.08228
162.87 0.05 65840.6176 29073.09911 3292.03089 0.02209 1454.09562
163.28 0.05 67181.0708 29665.17957 3359.05354 0.02209 1483.69964
163.69 0.05 68548.8144 30269.31423 3427.44072 0.02209 1513.90637
164.09 0.05 69944.4039 30885.7485 3497.2202 0.02209 1544.72809
164.5 0.05 71368.4064 31514.7328 3568.42032 0.02209 1576.1773
164.91 0.05 72821.4002 32156.52263 3641.07001 0.02209 1608.26679
165.32 0.05 74303.9756 32811.3787 3715.19878 0.02209 1641.0096
165.72 0.05 75816.7348 33479.56702 3790.83674 0.02209 1674.41901
166.13 0.05 77360.2324 34161.35903 3868.01462 0.02209 1708.50861
166.54 0.05 78935.2754 34867.03169 3946.76377 0.02209 1743.29225
166.94 0.05 80542.3236 35566.86759 4027.11618 0.02209 1778.78404
167.35 0.05 82182.0898 36291.15508 4109.10449 0.02209 1814.99842
167.76 0.05 83855.24 37030.18838 4192.762 0.02209 1851.95008
168.17 0.05 85562.4541 37784.26771 4278.1227 0.02209 1889.65495
168.57 0.05 87304.4254 38553.69939 4365.22127 0.02209 1928.12563
168.98 0.05 89081.8616 39338.79598 4454.09308 0.02209 1967.38046
169.39 0.05 90895.4847 40139.87639 4544.77424 0.02209 2007.43448
169.79 0.05 92746.0315 40967.26696 4637.30158 0.02209 2048.30396
170.2 0.05 94634.2537 41791.297 4731.71269 0.02209 2090.00551
170.61 0.05 96560.9184 42642.30804 4828.04592 0.02209 2132.55606
171.02 0.05 98526.8081 43510.64486 4926.34041 0.02209 2175.9729
171.42 0.05 100532.721 44396.66021 5026.63607 0.02209 2220.27367
171.83 0.05 102579.473 45300.714 5128.97367 0.02209 2265.47636
172.24 0.05 104667.895 46223.17347 5233.39476 0.02209 2311.59934

Supporting information S3B: Determining qp-mu

mu	qP-chemostat	qP-model	Y' x/s-chemostat	Y' x/s-model	Ymax				
0.0214	0.00942408			0.393446692	ms	0.558665634			
0.0214	0.00548425			0.429760001		0.01610702			
0.0300	0.01366642			0.461721038					
0.0300	0.01861648			0.485807197					
0.0429	0.02198017			0.500306651	mu		qp-mw	qp-ber	abwq
0.0429	0.02478302			0.511932115		0.0214	0.007454168	0.01142715	1.5785E-05
0.0429	0.01380683			0.519695252		0.0300	0.016141451	0.01506134	1.1666E-06
0.0429	0.01312244			0.527048227		0.0429	0.018393116	0.01977912	1.921E-06
0.0600	0.02686704			0.530803296		0.0600	0.023640925	0.02499969	1.8462E-06
0.0600	0.02549045			0.533761104		0.0771	0.029522151	0.02929543	5.1404E-08
0.0600	0.02273412					0.0986	0.037435874	0.03370163	1.3945E-05
0.0600	0.01947209					0.1200	0.040999776	0.03730901	1.3622E-05
0.0771	0.0311849					0.1500	0.0429	0.04138437	2.344E-06
0.0771	0.03269057					0.1714	0.037013693	0.04377521	4.5718E-05
0.0771	0.03192568					0.1929	0.046989715	0.04583472	1.334E-06
0.0771	0.02228746								9.7732E-05
0.0986	0.03146927					qmax	kq		
0.0986	0.04165805					0.073497784	0.11639688		
0.0986	0.0391803								
0.1200	0.04439684								
0.1200	0.04094591								
0.1200	0.03922942								
0.1200	0.03942693								
0.1500	0.04861801								
0.1500	0.04524051								
0.1500	0.03987847								
0.1500	0.03792453								
0.1714	0.04406404								
0.1714	0.02996334								
0.1929	0.04920574								
0.1929	0.04477368								
0.0214		0.011427153	0.381563458						
0.0300		0.015061342	0.40075						
0.0429		0.019779124	0.443939009						
0.0600		0.024999688	0.461716022						
0.0771		0.029295426	0.495263019						
0.0986		0.033701626	0.523190714						
0.1200		0.037309012	0.541306178						
0.1500		0.041384372	0.552882102						
0.1714		0.043775212							
0.1929		0.045834723							



Supporting information S3C: Calculation of the Yield Coefficient

D	Yx/s	1/d	1/y				
0.0086	0.275	116.666667	3.63901019	0.0086	0.279	0.25293252	0.000693487
0.0086	0.282	116.666667	3.54358611	0.0214	0.3816	0.38036202	1.44345E-06
0.0086	0.281	116.666667	3.56125356	0.0300	0.401	0.42073746	0.000399498
0.0214	0.386	46.6666667	2.58948459	0.0429	0.444	0.45713078	0.000174023
0.0214	0.383	46.6666667	2.61112562	0.0600	0.462	0.48510481	0.000547035
0.0214	0.382	46.6666667	2.61780105	0.0771	0.495	0.50217738	4.78084E-05
0.0214	0.375	46.6666667	2.66595575	0.0986	0.523	0.51599455	5.17848E-05
0.0300	0.408	33.3333333	2.44917952	0.1200	0.541	0.52528575	0.000256654
0.0300	0.393	33.3333333	2.54323499	0.1500	0.553	0.53413415	0.000351486
0.0429	0.438	23.3333333	2.2826082	0.2		0.54328576	0.002523221
0.0429	0.428	23.3333333	2.33884917	ymax	ky		
0.0429	0.459	23.3333333	2.17675229	0.57272414	0.01083716		
0.0429	0.451	23.3333333	2.2187708				
0.0600	0.460	16.6666667	2.17202257				
0.0600	0.460	16.6666667	2.17503028				
0.0600	0.465	16.6666667	2.15285253				
0.0600	0.462	16.6666667	2.16356556				
0.0771	0.514	12.962963	1.94517247				
0.0771	0.502	12.962963	1.99259215				
0.0771	0.474	12.962963	2.11148649				
0.0771	0.492	12.962963	2.034588				
0.0986	0.550	10.1449275	1.81728262				
0.0986	0.511	10.1449275	1.95656427				
0.0986	0.508	10.1449275	1.96772924				
0.1200	0.560	8.33333333	1.78568178				
0.1200	0.568	8.33333333	1.76113849				
0.1200	0.514	8.33333333	1.94590387				
0.1200	0.524	8.33333333	1.91021968				
0.1500	0.577	6.66666667	1.73408262				
0.1500	0.578	6.66666667	1.72934201				
0.1500	0.527	6.66666667	1.89897455				
0.1500	0.530	6.66666667	1.88679245				
0.1714	0.529	5.83333333	1.89000189				
0.1714	0.538	5.83333333	1.8594273				
0.1929	0.525	5.18518519	1.90403656				
0.1929	0.526	5.18518519	1.90294957				

