FIGURE 1

F2-2-11

# 2011	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
8	20110609	313486	F2-2-11	Seed	120000	123,600	53.71	55.32	70.81

(SL-F2-2-11) was inoculated on 5-31-11 from (G1A at log hour 73). This run was batched to 110,000 liters with media based on 120,000 liters. **1100** liters Fed batch media was added over a 38 hour period between log hours 24-62. **53,372** lbs of glucose was added during this run. The harvest was started on 06-03-11 at log hour 73. This run was clean and spray dried.

F2-3-11

# 2011	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
10	20110705	314418	F2-3-11	Seed	120,000	125,300	57.40	59.94	72.86

(SL-F2-3-11) was inoculated on 6-23-11 from (G1A at log hour 72). This run was batched to 110,000 liters with media based on 120,000 liters. **1100** liters Fed batch media was added over a 34 hour period between log hours 24 and 58. **64,693** lbs of glucose was added during this run. The harvest was started on 06-27-11 at log hour 89. This run was clean and spray dried.

F2-4-11

# 2011	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
11	20110709	314682	F2-4-11	Seed	120,000	114,700	29.11	27.82	69.03

FIGURE 1 CONTINUED

(SL-F2-4-11) was inoculated on 7-01-11 from (G1A at log hour 52). **1100** liters of fed batch media was added over a 34 hour period between log hours 34-68. **32,047** lbs of glucose was added during this run. The harvest was started on 07-05-11 at log hour 86. This run was clean and spray dried.

F2-5-11

# 2011	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
13	20110718	314973	F2-5-11	Seed	120,000	131,200	64.15	70.14	70.1

(SL-F2-5-11) was inoculated on 07-08-11 from (G1A at log hour 52). This run was batched to 110,000 liters with media based on 120,000 liters. **1100** liters of Fed batch media was added over a 38 hour period between log hours 24-62. **74,365** lbs of glucose was added during this run. Began chilling the vessel to 48°F at log hour 77. The harvest was started on 07-12-11 at log hour 82. This run was clean and spray dried.

F2-6-11

# 2011	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
14	20110725	315181	F2-6-11	Seed	120,000	131000	57.19	62.43	73.55

(SL-F2-6-11) was inoculated on 07-15-11 from (G1 at log hour 84). This run was batched to 110,000 liters with media based on 120,000 liters. **1,100** liters of Fed batch media was added over a 37 hour period between log hours 25 and 62. **65,520** lbs of glucose was added during this run. Began chilling down to 48° F at log hour 67. The harvest was started on 07-18-11 at log hour 77. This run was clean and spray dried.

FIGURE 1 CONTINUED

F2-8-11

# 2011	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
16	20110804	315665	F2-8-11	Seed	120,000	126,400	56.51	59.52	70.86

(SL-F2-8-11) was inoculated on 7-25-11 from (G1 at log hour 77). **1,000** liters of Fed batch media was added over a 30 hour period between log hours 24 -54 . **61,576** lbs of glucose was added during this run. Started chilling the vessel to 48° F on 07-28-11 at log hour 61 due to contamination. Harvest was started on 07-28-11 at log hour. This run was clean and spray dried.

F2-9-11

# 2011	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
18	20110811	315869	F2-9-11	Seed	120,000	133,200	59.54	66.09	76.89

(SL-F2-9-11) was inoculated on 8-03-11 from (G1A at log hour 89). **1200** liters of Fed batch media was added over a 40 hour period between log hours 24 -64. **74,300** lbs of glucose was added during this run. Stated chilling the vessel to 48° F on 08-06-11 at log hour 69. Harvest started at log hour 79. This was a clean run and Spray dried.

F2-10-11

# 2011	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
19	20110816	316416	F2-10-11	D/R	120,000	131,500	50.98	55.87	72.15

(SL-F2-10-11) was inoculated on 8-08-11 from (G1 at log hour 769). **1200** liters of Fed batch media was added over a 37 hour period between log hours 24 -56. 70,906 lbs of glucose was added during this run. Started chilling the vessel to 48° F on 08-11-11 at log hour 72. Harvest was started on 08-08-21-11 at log hour 79. This run was clean and spray dried.

FIGURE 1 CONTINUED

F1-8-11

# 2011	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
20	20110817	316266	F1-8-11	Seed	80,000	87,000	70.40	76.56	76.31

(SL-F1-8-11) was inoculated on 8-11-11 from (G1A at log hour 77). **800** liters of Fed batch media was added over a 34 hour period between log hours 24 -58. **50,544** lbs of glucose was added during this run. Started chilling the vessel to 48° F on 08-11-11 at log hour 72. Harvest was started on 08-14-11 at log hour 89. This run was clean and spray dried.

F2-11-11

# 2011	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
21	20110822	316379	F2-11-11	Seed	120,000	129,400	57.39	61.89	73.64

(SL-F2-11-11) was inoculated on 8-14-11 from (G1 at log hour 81). **1205.6** liters of Fed batch media was added over a 35 hour period between log hours 24- 59. **72,745** lbs of glucose was added during this run. Started chilling the vessel to 48° F on 08-17-11 at log hour 72. Harvest was started on 08-18-11 at log hour 82. This run was clean and spray dried.

F1-9-11

# 2011	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
22	20110823	316489	F1-9-11	Seed	80,000	86000	76.18	81.89	75.57

FIGURE 1 CONTINUED

(SL-F1-9-11) was inoculated on 8-18-11 from (G1A at log hour 69). **804** liters of Fed batch media was added over a 37 hour period between log hours 24- 61. **46,555** lbs of glucose was added during this run. Started chilling the vessel to 48° F on 08-21-11 at log hour 72. Harvest was started on 08-22-11 at log hour 84. This run was clean and spray dried.

F2-13-11

# 2011	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
25	20110908	316981	SL F2-13-11	Seed	120,000	124,100	55.64	57.54	70.95

(SL-F2-13-11) was inoculated on 09-03-11 (from G1 @ log hour 80). 1208.6 liters of fed batch media was fed over a 34 hour period. 59,864 lbs. of glucose was fed over the duration of this run. Started chilling to 48 F on 09-06-11 at log hour 70. Started the harvest at log hour 84.

F2-14-11

# 2011	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
28	20110920	317584	F2-14-11	Seed	120,000	122,100	60.62	61.68	69.13

(SL-F2-14-11) was inoculated on 09-12-11 (from G1A @ log hour 77). 1207 liters of fed batch media was fed over a 38 hour period. 67,698 lbs. of glucose was fed over the duration of this run. Started chilling to 48 F on 09-16-11 at log hour 76. Started the harvest at log hour 84.

- Temperature deviation due to chilled water compressor failure (Vessel temperature reached 91 F).
- Lost air and buttoned up the fermenter due to chilled water compressor failure.

F1-13-11

# 2011	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
29	20110922	317681	F1-13-11	Seed	80,000	81,300	60.89	61.88	67.56

FIGURE 1 CONTINUED

(SL-F1-13-11) was inoculated on 09-16-11 (from G1 @ log hour). **600** liters of fed batch media was fed over a 34 hour period. 27,732 lbs of glucose was fed over the duration of this run. Started chilling to 48 F on 09-19-11 at log hour 65. Started the harvest at log hour 74

- Problems with fed batch flow control valve – Changed diaphragm briefly exposing vessel -- No contamination detected during this run.
- Log hour 9 vessel heated to 93 F. Chilled water valve was closed due to control valve leaking by.

F1-14-11

# 2011	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
31	20110928	317961	F1-14-11	Seed	80,000	91,000	86.88	98.83	68.57

(SL-F1-14-11) was inoculated on 09-23-11 (from G1 @ log hour 64). **800** liters of fed batch media was fed over a 34 hour period. 45,590 lbs of glucose was fed over the duration of this run. Started chilling to 48 F on 09-26-11 at log hour 70. Started the harvest at log hour 83.

F3-4-11

# 2011	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
32	20111003	318192	SL F3-4-11	Seed	120,000	125,000	62.15	64.74	68.8

(SL-F3-4-11) was inoculated on 09-27-11 (from G1A @ log hour 90). **1205** liters of fed batch media was fed over a 34 hour period. 52,076 lbs of glucose was fed over the duration of this run. Started chilling to 48 F on 09-30-11 at log hour 70. Started the harvest at log hour 84.

- Foamed out approximately 4,500 liters at log 18.

F1-15-11

# 2011	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
34	20111010	318457	SL F1-15-11	Seed	80,000	86,100	89.83	96.67	70.58

FIGURE 1 CONTINUED

(SL-F1-15-11) was inoculated on 10-05-11 (from G1 @ log hour 100). **800** liters of fed batch media was fed over a 34 hour period. 59,984 lbs. of glucose was fed over the duration of this run. Started chilling down on 10-0 -11 at log hour 70. Started the harvest at log hour 78.

- Modified media.
- Modified fed batch media.

F1-16-11

# 2011	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
36	20111017	318716	SL F1-16-11	Seed	80,000	85,400	74.26	79.27	72.72

(SL-F1-16-11) was inoculated on 10-10-11 (from G1 @ log hour 84.5). **800** liters of fed batch media was fed over a 34 hour period. 39,851 lbs of glucose was fed over the duration of this run. Started chilling down on 10-13-11 at log hour 70. Started the harvest at log hour 77.

- Modified media.
- Modified fed batch media.
- Normal fed batch media.

F3-8-11

# 2011	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
46	20111111	319550	SL F3-8-11	Seed	120,000	130,200	75.70	82.13	71.75

(SL-F3-8-11) was inoculated on 11-03-11 (from G1 @ log hour 94). **1200** liters of fed batch media was fed over a 34 hour period. 67,800 lbs of glucose was fed over the duration of this run. Started chilling to 48° F on 11-06-11 at log hour 75. Started the harvest at log hour 91.

FIGURE 1 CONTINUED

F5-5-11

# 2011	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
48	20111115	319771	SL F5-5-11	Seed	220,000	233,560	69.81	74.11	68.7

(SL-F5-5-11) was inoculated on 11-08-11 (from SV3 @ log hour 90). 2217 liters of fed batch media was fed over a 34 hour period. 45,836 liters of glucose was fed over the duration of this run. Started transferring 50% of F4 to F2 and chilling to 48° F on 11-11-11 at log hour 78. Started harvesting to centrifuges from F2 at log hour 88.

F3-14-11

# 2011	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
63	20111222	321061	SL F3-14-11	Seed	120,000	132,400	73.30	80.87	76.24

(SL-F3-14-11) was inoculated on 12-16-11 (from G1 @ log hour 106). 1282.7 liters of fed batch media was fed over a 34 hour period. 74,355 lbs of glucose was fed over the duration of this run. Started chilling to 48° F on 12-19-11 at log hour 72. Started the harvest at log hour 87.

- ph adjust chlorides with citric acid before filtering.

F1-25-11

# 2011	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
64	20111223	321102	SL F1-25-11	Seed	80,000	83,000	82.59	85.69	74.8

(SL-F1-25-11) was inoculated on 12-18-11 (from G1A @ log hour 91). 797.7 liters of fed batch media was fed over a 34 hour period. 43,673 lbs of glucose was fed over the duration of this run. Started chilling to 48° F on 12-21-11 at log hour 68. Started the harvest at log hour 94.

- ph adjusted chlorides before filtering.

FIGURE 1 CONTINUED

F3-15-11

# 2011	*DATE POSTED*	*PROD ORDER #*	*VESSEL/ RUN#*	*Origin*	*Batch Volume (L)*	*Final Tank Volume(L)*	*BIOMASS g/L*	*Volume Adjusted g/L*	*% FAT*
66	20111228	321150	SL-F3-15-11	Seed	120,000	131,000	71.15	77.67	75.8

(SL-F3-15-11) was inoculated on 12-23-11 (from G1 @ log hour 82). 1192.1 liters of fed batch media was fed over a 34 hour period. 76,953 lbs of glucose was fed over the duration of this run. Started chilling to 48° F on 12-26-11 at log hour 71. Started the harvest at log hour 85.

- ph adjust chlorides with citric acid before filtering.

F1-1-12

# 2012	*DATE POSTED*	*PROD ORDER #*	*VESSEL/ RUN#*	*Origin*	*Batch Volume (L)*	*Final Tank Volume(L)*	*BIOMASS g/L*	*Volume Adjusted g/L*	*% FAT*
1	20120103	321175	SL F1-1-12	Seed	80,000	83,600	76.18	79.61	70.24

(SL-F1-1-12) was inoculated on 12-25-11 (from G1A @ log hour 69). 806.4 liters of fed batch media was fed over a 34 hour period. 40,847 lbs of glucose was fed over the duration of this run. Started chilling to 48° F on 12-28-11 at log hour 73. Started the harvest at log hour 85.

- ph adjusted chlorides before filtering.

F4-1-12

# 2012	*DATE POSTED*	*PROD ORDER #*	*VESSEL/ RUN#*	*Origin*	*Batch Volume (L)*	*Final Tank Volume(L)*	*BIOMASS g/L*	*Volume Adjusted g/L*	*% FAT*
5	20120116	400538.1	SL F4-1-12	Seed	220,000	231,400	68.69	72.25	68.53

(SL-F4 -1-12) was inoculated on 01-09-12 (from SV3 @ log hour). 2220.2 liters of fed batch media was fed over a 32 hour period. 42,343 liters of glucose was fed over the duration of this run. Started chilling to 48° F on 01-12-12 at log hour 74 and sending half to F2 to assist in chilling. Started centrifuging at log hour 79 from F4 first.

9/21

FIGURE 1 CONTINUED

F6-2-12

# 2012	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
6	20120120	400684.1	SL F6-2-12	Seed	216,000	237,200	76.27	83.76	69.13

(SL-F6 -2-12) was inoculated on 01-12-12 (from SV3 @ log hour 43). 2223.4 liters of fed batch media was fed over a 32 hour period. 57,288 Liters of glucose was fed over the duration of this run. Started chilling to 48° F on 01-15-12 at log hour 85 and sending half to F2 to assist in chilling. Started centrifuging at log hour 89 from F6 first.

F5-2-12

# 2012	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
7	20120126	400940.1	SL-F5-2-12	Seed	224,000	241,120	76.62	82.48	75

(SL-F5 -2-12) was inoculated on 01-16-12 (from **SL-F6-2-12** @ log hour 85). 2218.7 liters of fed batch media was fed over a 32 hour period. **55,998** liters of glucose was fed over the duration of this run. Started chilling to 48° F on 01- 20-12 at log hour 97 and sending half to F2 to assist in chilling. Started centrifuging at log hour 117 from F5 first.

F4-2-12

# 2012	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
8	20120130	401149.1	SL-F4-2-12	Seed	220,000	231,000	65.54	68.82	69.1

(SL-F4 -2-12) was inoculated on 01-20-12 (from **SV-3** @ log hour 47). 2215.4 liters of fed batch media was fed over a 32 hour period. 40,744 liters of glucose was fed over the duration of this run. Started chilling to 48° F on 01-23-12 at log hour 73. Started centrifuging at log hour *161*.

FIGURE 1 CONTINUED

- Harvest was delayed due to the spray dryer issues.

F6-3-12

# 2012	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
9	20120209	401534.1	SL-F6-3-12	Seed	220,000	229,720	56.16	58.64	69.34

(SL-F6-3-12) was inoculated on 02-01-12 (from SV3 @ log hour 46). **2215.6** liters of fed batch media was fed over a 32 hour period. 35,494 liters of glucose was fed over the duration of this run. Started chilling and harvesting on 02-04-12 at log hour 78. Harvested straight to centrifuges at log hour 94 and did not use F2 as a harvest tank.

- Temperature excursion from log hour 13 to 21 due to temperature control in ROUT mode and not RCAS mode. Modifications were made to the procedure to ensure the temperature control is placed in RCAS mode when batching is started.

F5-3-12

# 2012	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
10	20120215	401824.1	SL-F5-3-12	Seed	220,000	224,300	59.62	60.79	67.28

(SL-F5-3-12) was inoculated on 02-07-12 (from SV3 @ log hour 46). 2214.9 liters of fed batch media was fed over a 32 hour period. 36,746 liters of glucose was fed over the duration of this run. Started chilling and harvesting on 02-11-12 at log hour 93. Harvested straight to centrifuges and did not use F2 as a harvest tank.

F1-2-12

# 2012	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
11	20120229	402398.1	SL-F1-2-12	Seed	80,000	83,600	89.65	93.68	71.09

FIGURE 1 CONTINUED

(SL-F1-2-12) was inoculated on 02-22-12 (from G1 @ log hour 54). 797.9 liters of fed batch media was fed over a 32 hour period. 48,871 lbs of glucose was fed over the duration of this run. Started chilling to 48° F on 12-28-11 at log hour 72. Started the harvest at log hour 81.

F1-4-12

# 2012	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
18	20120328	403430.1	SL-F1-4-12	Seed	80,000	89,200	90.29	100.67	68.42

(SL-F1-4-12) was inoculated on 03-22-12 (from G1 @ log hour 71). 803.6 liters of fed batch media was fed over a 34 hour period. 59,067 lbs of glucose was fed over the duration of this run. Started chilling to 48° F on 03-25-12 at log hour 72. Started centrifuging at log hour 83.

F3-4-12

# 2012	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
27	20120501	404568.1	SL-F3-4-12	Seed	120,000	129,200	85.00	91.52	70.93

(SL-F3-4-12) was inoculated on 04-25-12 (from G1 @ log hour 67). 1193.8 liters of fed batch media was fed over a 34 hour period. 92,224 lbs of glucose was fed over the duration of this run. Started chilling to 48° F on 04-28-12 at log hour 72. Started centrifuging at log hour 89.

F6-7-12

# 2012	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
28	20120507	404695.1	SL-F6-7-12	Seed	220,000	241,580	73.37	80.57	70.95

(SL-F6-7-12) was inoculated on 04-27-12 (from SV-3 @ log hour 77). 2217.2 liters of fed batch media was fed over a 34 hour period. 53,951 of glucose was fed over the duration of this run. Started chilling to 48° F on 04-30-12 at log hour 81. Started centrifuging at log hour 108.

F1-8-12

# 2012	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
29	20120508	404849.1	SL-F1-8-12	Seed	80,000	89,300	89.04	99.39	72.08

(SL-F1-8-12) was inoculated on 04-30-12 (from G1A @ log hour 74). 795.5 liters of fed batch media was fed over a 34 hour period. 53,393 lbs of glucose was fed over the duration of this run. Started chilling to 48° F on 05-03-12 at log hour 72. Started centrifuging at log hour 122.

- Run using antifoam ESP FC 131. It appeared to work well in F1.
- Problems occurred spray drying. The product was very sticking and not flowing well. 260 kilos of oily clumps was lost in the sifter overflow. The product from the sifter overflow could not be recovered. The dryer also had an oily product build up.

F3-6-12

# 2012	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
31	20120525	405450.1	SL-F3-6-12	Seed	120,000	123,800	74.09	76.44	72.15

(SL-F3-6-12) was inoculated on 05-18-12 (from G1 @ log hour 89). 1201.5 liters of fed batch media was fed over a 34 hour period. 78,211 lbs of glucose was fed over the duration of this run. Started chilling to 48° F on 05-21-12 at log hour 72. Started centrifuging at log hour 84.

- Using ESP FC 131 Antifoam.

F3-7-12

# 2012	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
32	20120531	405587.1	SL-F3-7-12	Seed	120,000	126,800	78.12	82.55	69.63

(SL-F3-7-12) was inoculated on 05-24-12 (from G1 @ log hour 72). 1197 liters of fed batch media was fed over a 34 hour period. 80,494 lbs of glucose was fed over the duration of this run. Started chilling to 48° F on 05-21-12 at log hour 72. Started centrifuging at log hour 83.

FIGURE 1 CONTINUED

- Using ESP FC 131 Antifoam.
- Foam out around log hour 15-16. Lost approximately 2,000 liter.
- Lost unknown amount during harvest due to CT-2 sample port being left open. NCR issued.

F3-8-12

# 2012	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
33	20120605	405739.1	SL-F3-8-12	Seed	120,000	126,900	66.06	69.86	71.77

(SL-F3-8-12) was inoculated on 05-30-12 (from G1A @ log hour 73). **1289** liters of fed batch media was fed over a 34 hour period. 70,747 lbs of glucose was fed over the duration of this run. Started chilling to 48° F on 06-02-12 at log hour 72. Started centrifuging at log hour 81.

F3-9-12

# 2012	DATE POSTED	PROD ORDER #	VESSEL/ RUN#	Origin	Batch Volume (L)	Final Tank Volume(L)	BIOMASS g/L	Volume Adjusted g/L	% FAT
34	20120612	405946.1	SL-F3-9-12	Seed	120,000	131,900	79.18	87.03	69.18

(SL-F3-9-12) was inoculated on 06-05-12 (from G1 @ log hour 73). **1199.5** liters of fed batch media was fed over a 34 hour period. 87,424 lbs of glucose was fed over the duration of this run. Started chilling to 48° F on 06-05-12 at log hour 72. Started centrifuging at log hour 86.

FIGURE 2

a) F1-2-11

F1-2-11	
FATTY ACID PROFILE	
TEST	RESULTS
C 06:0 (Caproic acid)	<0.10 %
C 07:0 (Heptanoic acid)	<0.10 %
C 08:0 (Caprylic acid)	<0.10 %
C 09:0 (Nonanoic acid)	<0.10 %
C 10:0 (Capric acid)	<0.10 %
C 11:0 (Undecanoic acid)	<0.10 %
C 12:0 (Lauric acid)	<0.10 %
C 13:0 (Tridecanoic acid)	<0.10 %
C 14:0 (Myristic acid)	4.01%
C 14:1 (Myristoleic acid)	1.35%
C 15:0 (Pentadecanoic acid)	<0.10 %
C 15:1 (Pentadecenoic acid)	<0.10 %
C 16:0 (Palmitic acid)	54.42%
C 16:1 (Palmitoleic acid)	<0.10 %
C 17:0 (Margaric acid)	0.51%
C 17:1 (Margaroleic acid)	<0.10 %
C 18:0 (Stearic acid)	1.81%
C 18:1n7 (Vaccenic acid)	<0.10 %
C 18:1n9 (Oleic acid)	<0.10 %
C 18:1n9t (Elaidic acid)	<0.10 %
C 18:2n6 (Linoleic acid)	<0.10 %
C 18:2n6t (Linolelaidic acid)	<0.10 %
C 18:3n3 (alpha-Linolenic)	<0.10 %
C 18:3n6 (gamma-Linolenic)	<0.10 %
C 19:0 (Nonadecanoic acid)	<0.10 %
C 20:0 (Arachidic acid)	0.31%
C 20:1 (Eicosenoic acid)	<0.10 %
C 20:2n6 (Eicosadienoic acid)	<0.10 %
C 20:3n3 (Eicosatrienoic acid)	<0.10 %
C 20:3n6 (homo-gamma-Linolenic acid)	<0.10 %
C 20:4n6 (Arachidonic acid)	<0.10 %
C 20:5n3 (Eicosapentaenoic acid)	0.37%
C 21:0 (Heneicosanoic acid)	<0.10 %
C 22:0 (Behenic acid)	0.18%
C 22:1 (Erucic acid)	0.63%
C 22:2n6 (Docosadienoic acid)	0.45%

FIGURE 2 CONTINUED

C 22:5n3 (Docosapentaenoic acid)	<0.10 %
C 22:6n3 (Docosahexaenoic acid)	27.22%
C 23:0 (Tricosanoic acid)	<0.10 %
C 24:0 (Lignoceric acid)	<0.10 %
C 24:1 (Nervonic acid)	<0.10 %
Unknown Components	0.95%

b) F1-9-11

F1-9-11	
FATTY ACID PROFILE	
TEST	RESULTS
C 06:0 (Caproic acid)	<0.10 %
C 07:0 (Heptanoic acid)	<0.10 %
C 08:0 (Caprylic acid)	<0.10 %
C 09:0 (Nonanoic acid)	<0.10 %
C 10:0 (Capric acid)	<0.10 %
C 11:0 (Undecanoic acid)	<0.10 %
C 12:0 (Lauric acid)	<0.10 %
C 13:0 (Tridecanoic acid)	<0.10 %
C 14:0 (Myristic acid)	4.15%
C 14:1 (Myristoleic acid)	1.51%
C 15:0 (Pentadecanoic acid)	<0.10 %
C 15:1 (Pentadecenoic acid)	<0.10 %
C 16:0 (Palmitic acid)	55.50%
C 16:1 (Palmitoleic acid)	<0.10 %
C 17:0 (Margaric acid)	0.53%
C 17:1 (Margaroleic acid)	<0.10 %
C 18:0 (Stearic acid)	1.77%
C 18:1n7 (Vaccenic acid)	<0.10 %
C 18:1n9 (Oleic acid)	<0.10 %
C 18:1n9t (Elaidic acid)	<0.10 %
C 18:2n6 (Linoleic acid)	<0.10 %
C 18:2n6t (Linolelaidic acid)	<0.10 %
C 18:3n3 (alpha-Linolenic)	<0.10 %
C 18:3n6 (gamma-Linolenic)	<0.10 %
C 19:0 (Nonadecanoic acid)	<0.10 %
C 20:0 (Arachidic acid)	0.30%
C 20:1 (Eicosenoic acid)	<0.10 %
C 20:2n6 (Eicosadienoic acid)	<0.10 %
C 20:3n3 (Eicosatrienoic acid)	<0.10 %
C 20:3n6 (homo-gamma-Linolenic acid)	<0.10 %

FIGURE 2 CONTINUED

C 20:4n6 (Arachidonic acid)	<0.10 %
C 20:5n3 (Eicosapentaenoic acid)	0.13%
C 21:0 (Heneicosanoic acid)	<0.10 %
C 22:0 (Behenic acid)	<0.10 %
C 22:1 (Erucic acid)	0.58%
C 22:2n6 (Docosadienoic acid)	0.43%
C 22:5n3 (Docosapentaenoic acid)	<0.10 %
C 22:6n3 (Docosahexaenoic acid)	27.03%
C 23:0 (Tricosanoic acid)	<0.10 %
C 24:0 (Lignoceric acid)	<0.10 %
C 24:1 (Nervonic acid)	<0.10 %
Unknown Components	0.57%

c) F1-5-11

F1-5-11	
FATTY ACID PROFILE	
TEST	RESULTS
C 06:0 (Caproic acid)	<0.10 %
C 07:0 (Heptanoic acid)	<0.10 %
C 08:0 (Caprylic acid)	<0.10 %
C 09:0 (Nonanoic acid)	<0.10 %
C 10:0 (Capric acid)	<0.10 %
C 11:0 (Undecanoic acid)	<0.10 %
C 12:0 (Lauric acid)	<0.10 %
C 13:0 (Tridecanoic acid)	<0.10 %
C 14:0 (Myristic acid)	3.42%
C 14:1 (Myristoleic acid)	1.92%
C 15:0 (Pentadecanoic acid)	<0.10 %
C 15:1 (Pentadecenoic acid)	<0.10 %
C 16:0 (Palmitic acid)	54.15%
C 16:1 (Palmitoleic acid)	<0.10 %
C 17:0 (Margaric acid)	0.85%
C 17:1 (Margaroleic acid)	<0.10 %
C 18:0 (Stearic acid)	1.80%
C 18:1n7 (Vaccenic acid)	<0.10 %
C 18:1n9 (Oleic acid)	<0.10 %
C 18:1n9t (Elaidic acid)	<0.10 %
C 18:2n6 (Linoleic acid)	<0.10 %
C 18:2n6t (Linolelaidic acid)	<0.10 %
C 18:3n3 (alpha-Linolenic)	<0.10 %
C 18:3n6 (gamma-Linolenic)	<0.10 %

FIGURE 2 CONTINUED

C 19:0 (Nonadecanoic acid)	<0.10 %
C 20:0 (Arachidic acid)	0.23%
C 20:1 (Eicosenoic acid)	<0.10 %
C 20:2n6 (Eicosadienoic acid)	<0.10 %
C 20:3n3 (Eicosatrienoic acid)	<0.10 %
C 20:3n6 (homo-gamma-Linolenic acid)	<0.10 %
C 20:4n6 (Arachidonic acid)	<0.10 %
C 20:5n3 (Eicosapentaenoic acid)	0.33%
C 21:0 (Heneicosanoic acid)	<0.10 %
C 22:0 (Behenic acid)	<0.10 %
C 22:1 (Erucic acid)	0.38%
C 22:2n6 (Docosadienoic acid)	0.42%
C 22:5n3 (Docosapentaenoic acid)	<0.10 %
C 22:6n3 (Docosahexaenoic acid)	27.34%
C 23:0 (Tricosanoic acid)	<0.10 %
C 24:0 (Lignoceric acid)	<0.10 %
C 24:1 (Nervonic acid)	<0.10 %
Unknown Components	0.62%

d) F1-14-11

F1-14-11	
FATTY ACID PROFILE	
TEST	RESULTS
C 06:0 (Caproic acid)	<0.10 %
C 07:0 (Heptanoic acid)	<0.10 %
C 08:0 (Caprylic acid)	<0.10 %
C 09:0 (Nonanoic acid)	<0.10 %
C 10:0 (Capric acid)	<0.10 %
C 11:0 (Undecanoic acid)	<0.10 %
C 12:0 (Lauric acid)	0.17%
C 13:0 (Tridecanoic acid)	<0.10 %
C 14:0 (Myristic acid)	4.57%
C 14:1 (Myristoleic acid)	<0.10 %
C 15:0 (Pentadecanoic acid)	1.44%
C 15:1 (Pentadecenoic acid)	<0.10 %
C 16:0 (Palmitic acid)	53.49%
C 16:1 (Palmitoleic acid)	0.14%
C 17:0 (Margaric acid)	0.45%
C 17:1 (Margaroleic acid)	<0.10 %
C 18:0 (Stearic acid)	1.67%
C 18:1n7 (Vaccenic acid)	<0.10 %

FIGURE 2 CONTINUED

C 18:1n9 (Oleic acid)	0.11%
C 18:1n9t (Elaidic acid)	<0.10 %
C 18:2n6 (Linoleic acid)	<0.10 %
C 18:2n6t (Linolelaidic acid)	<0.10 %
C 18:3n3 (alpha-Linolenic)	<0.10 %
C 18:3n6 (gamma-Linolenic)	<0.10 %
C 19:0 (Nonadecanoic acid)	<0.10 %
C 20:0 (Arachidic acid)	0.31%
C 20:1 (Eicosenoic acid)	<0.10 %
C 20:2n6 (Eicosadienoic acid)	<0.10 %
C 20:3n3 (Eicosatrienoic acid)	<0.10 %
C 20:3n6 (homo-gamma-Linolenic acid)	0.15%
C 20:4n6 (Arachidonic acid)	0.86%
C 20:5n3 (Eicosapentaenoic acid)	0.31%
C 21:0 (Heneicosanoic acid)	<0.10 %
C 22:0 (Behenic acid)	0.17%
C 22:1 (Erucic acid)	<0.10 %
C 22:2n6 (Docosadienoic acid)	<0.10 %
C 22:5n3 (Docosapentaenoic acid)	<0.10 %
C 22:6n3 (Docosahexaenoic acid)	27.33%
C 23:0 (Tricosanoic acid)	<0.10 %
C 24:0 (Lignoceric acid)	0.14%
C 24:1 (Nervonic acid)	0.22%
Unknown Components	1.42%

c) F1-15-11

F1-15-11	
FATTY ACID PROFILE	
TEST	RESULTS
C 06:0 (Caproic acid)	<0.10 %
C 07:0 (Heptanoic acid)	<0.10 %
C 08:0 (Caprylic acid)	<0.10 %
C 09:0 (Nonanoic acid)	<0.10 %
C 10:0 (Capric acid)	<0.10 %
C 11:0 (Undecanoic acid)	<0.10 %
C 12:0 (Lauric acid)	0.16%
C 13:0 (Tridecanoic acid)	<0.10 %
C 14:0 (Myristic acid)	4.43%
C 14:1 (Myristoleic acid)	0.18%
C 15:0 (Pentadecanoic acid)	1.17%
C 15:1 (Pentadecenoic acid)	<0.10 %

FIGURE 2 CONTINUED

C 16:0 (Palmitic acid)	55.87%
C 16:1 (Palmitoleic acid)	0.13%
C 17:0 (Margaric acid)	0.40%
C 17:1 (Margaroleic acid)	<0.10 %
C 18:0 (Stearic acid)	1.62%
C 18:1n7 (Vaccenic acid)	<0.10 %
C 18:1n9 (Oleic acid)	<0.10 %
C 18:1n9t (Elaidic acid)	<0.10 %
C 18:2n6 (Linoleic acid)	<0.10 %
C 18:2n6t (Linolelaidic acid)	<0.10 %
C 18:3n3 (alpha-Linolenic)	<0.10 %
C 18:3n6 (gamma-Linolenic)	<0.10 %
C 19:0 (Nonadecanoic acid)	<0.10 %
C 20:0 (Arachidic acid)	0.28%
C 20:1 (Eicosenoic acid)	<0.10 %
C 20:2n6 (Eicosadienoic acid)	<0.10 %
C 20:3n3 (Eicosatrienoic acid)	0.90%
C 20:3n6 (homo-gamma-Linolenic acid)	0.13%
C 20:4n6 (Arachidonic acid)	<0.10 %
C 20:5n3 (Eicosapentaenoic acid)	0.29%
C 21:0 (Heneicosanoic acid)	<0.10 %
C 22:0 (Behenic acid)	0.15%
C 22:1 (Erucic acid)	<0.10 %
C 22:2n6 (Docosadienoic acid)	0.43%
C 22:5n3 (Docosapentaenoic acid)	<0.10 %
C 22:6n3 (Docosahexaenoic acid)	26.92%
C 23:0 (Tricosanoic acid)	<0.10 %
C 24:0 (Lignoceric acid)	<0.10 %
C 24:1 (Nervonic acid)	0.22%
Unknown Components	0.65%

FIGURE 3

ALLTECH QUALITY ASSURANCE LABORATORIES

Typical Fatty Acid Profile of ALGAE-5 Meal

Fatty Acid	% of Fat content
Caproic Acid	<0.10%
Heptanoic Acid	<0.10%
Caprylic Acid	<0.10%
Nonanoic Acid	<0.10%
Capric Acid	<0.10%
Undecanoic Acid	<0.10%
Lauric Acid	<0.10%
Tridecanoic Acid	<0.10%
Myristic Acid	3.86%
Myristoleic Acid	1.60%
Pentadecanoic Acid	<0.10%
Palmitic Acid	54.69%
Palmitoleic Acid	<0.10%
Margaric Acid	0.63%
Margaroleic Acid	<0.10%
Stearic Acid	1.80%
Vaccenic Acid	<0.10%
Oleic Acid	<0.10%
Elaidic Acid	<0.10%
Linoleic Acid	<0.10%
Linolelaidic Acid	<0.10%
Alpha-Linoleic Acid	<0.10%
Gamma-Linoleic Acid	<0.10%
Nonadecanoic Acid	<0.10%
Arachidic Acid	0.28%
Eicosenoic Acid	<0.10%
Eicosadienoic Acid	<0.10%
Eicosatrienoic Acid	<0.10%
Homo-gamma-Linoleic Acid	<0.10%
Arachidonic Acid	<0.10%
Eicosapentaenoic Acid	0.28%
Heneicosanoic Acid	<0.10%
Behenic Acid	<0.10%
Erucic Acid	0.53%
Docosadienoic Acid	0.43%
Docosapentaenoic Acid	<0.10%
Docosahexaenoic Acid	27.20%
Tricosanoic Acid	<0.10%
Lignoceric Acid	<0.10%
Nervonic Acid	<0.10%
Unknown	0.71%