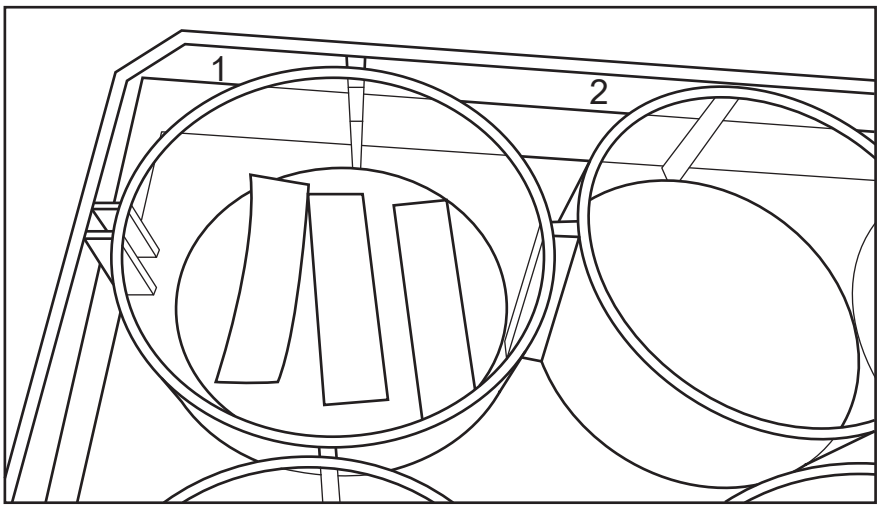


FIG. 1

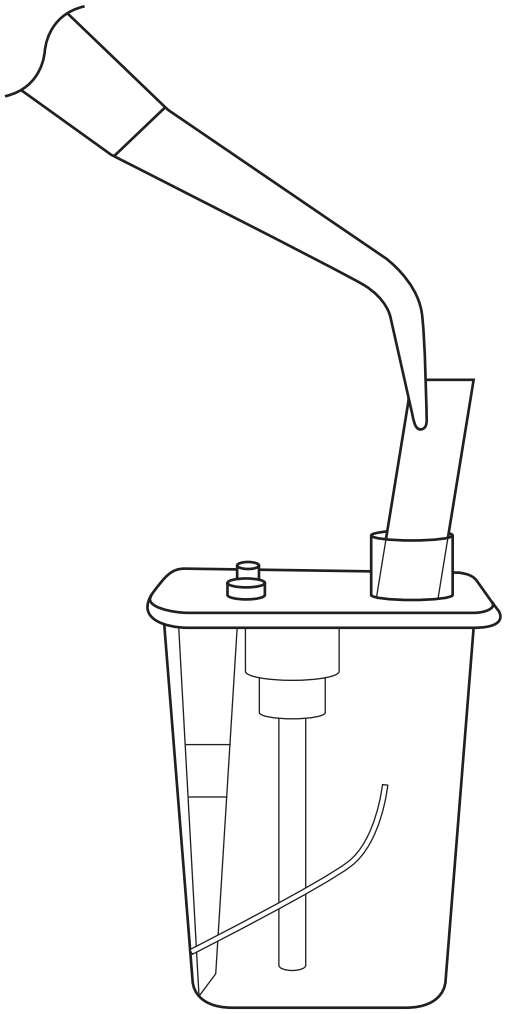


FIG. 2

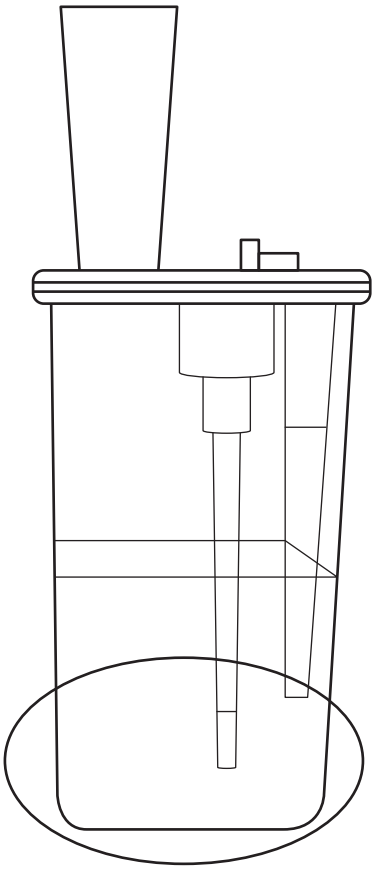


FIG. 3

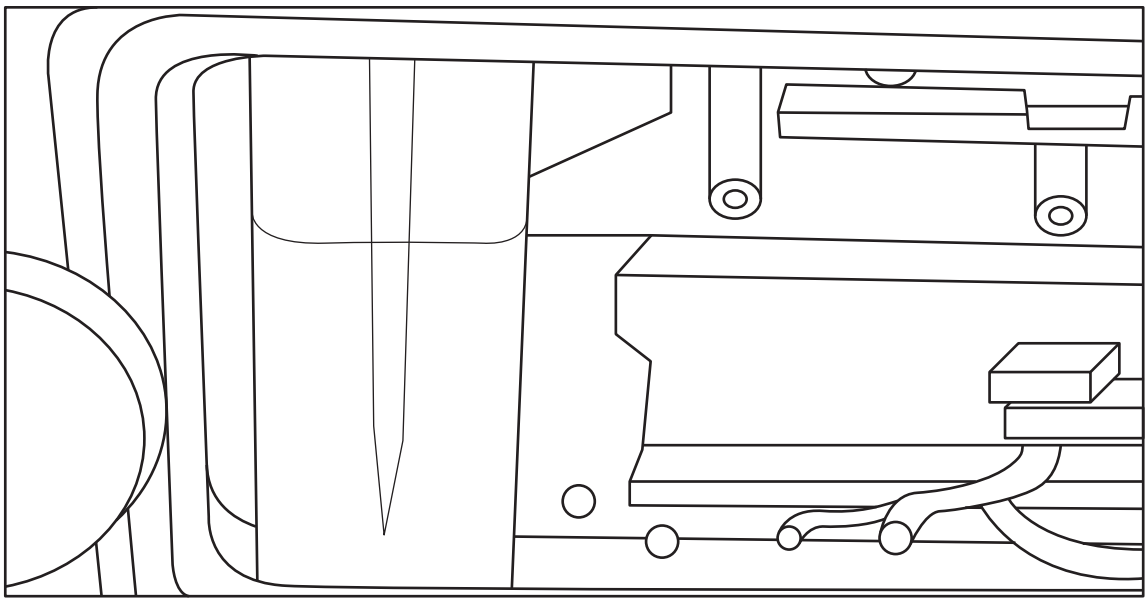


FIG. 4

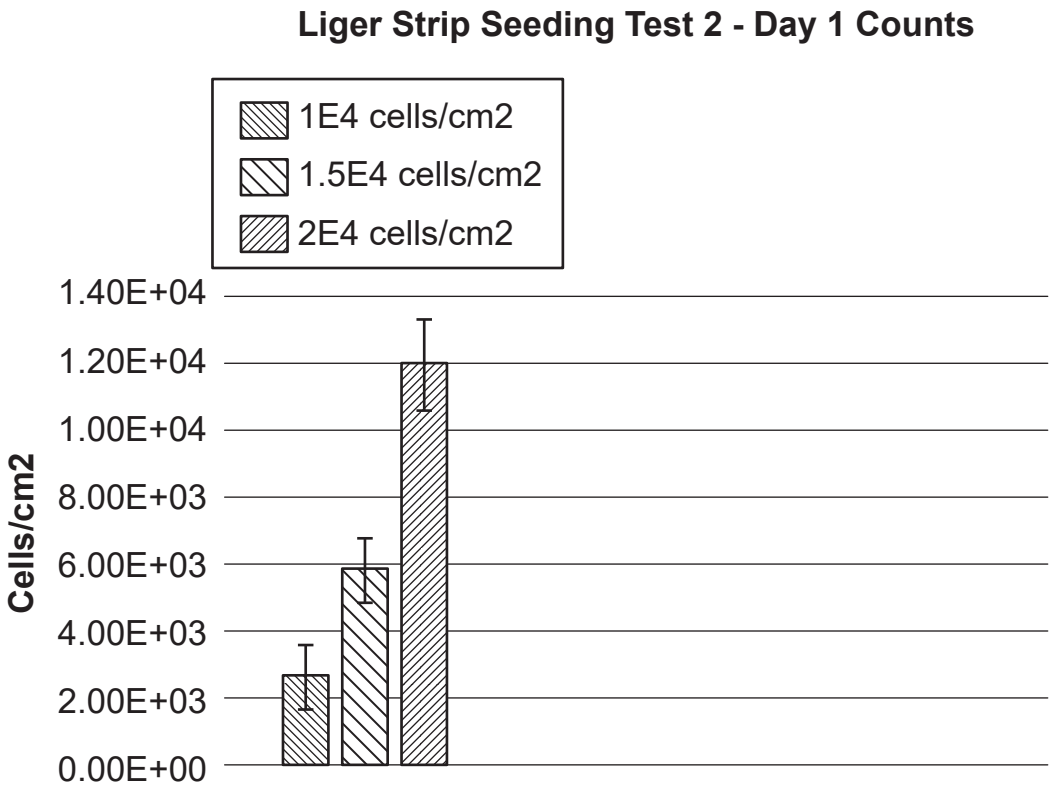

Liger Strip Seeding Test 2 - Day 1 Counts
1E4 cells/cm2
1.5E4 cells/cm2
2E4 cells/cm2
Cells/cm2
1.40E+04
1.20E+04
1.00E+04
8.00E+03
6.00E+03
4.00E+03
2.00E+03
0.00E+00

FIG. 5

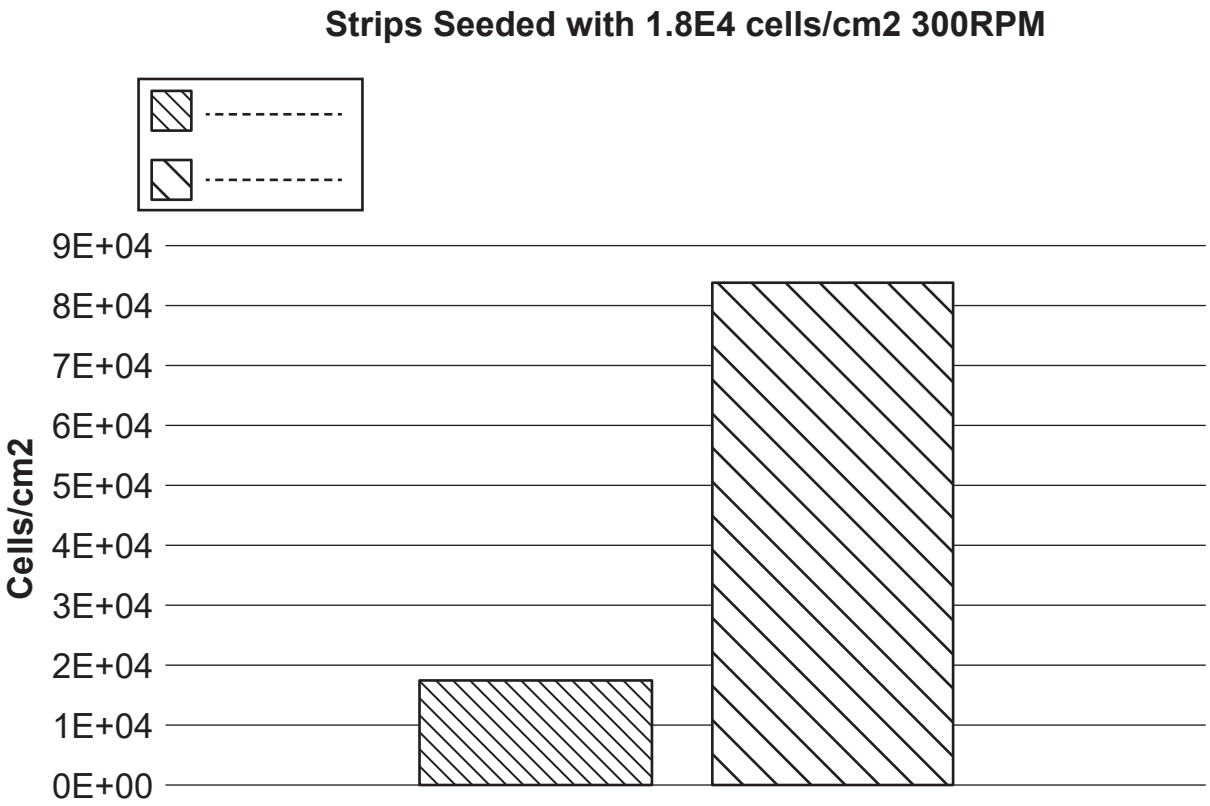

Strips Seeded with 1.8E4 cells/cm2 300RPM
Cells/cm2
9E+04
8E+04
7E+04
6E+04
5E+04
4E+04
3E+04
2E+04
1E+04
0E+00

FIG. 6

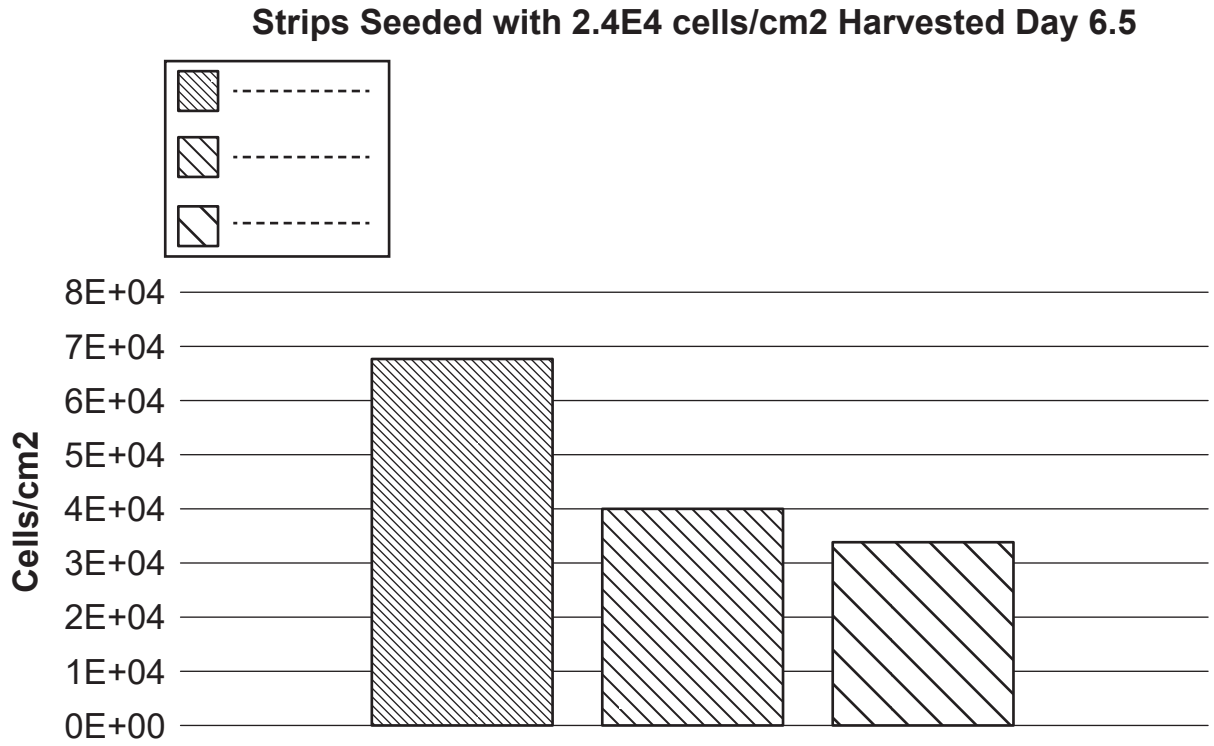

Strips Seeded with 2.4E4 cells/cm2 Harvested Day 6.5
Cells/cm2
8E+04
7E+04
6E+04
5E+04
4E+04
3E+04
2E+04
1E+04
0E+00

FIG. 7

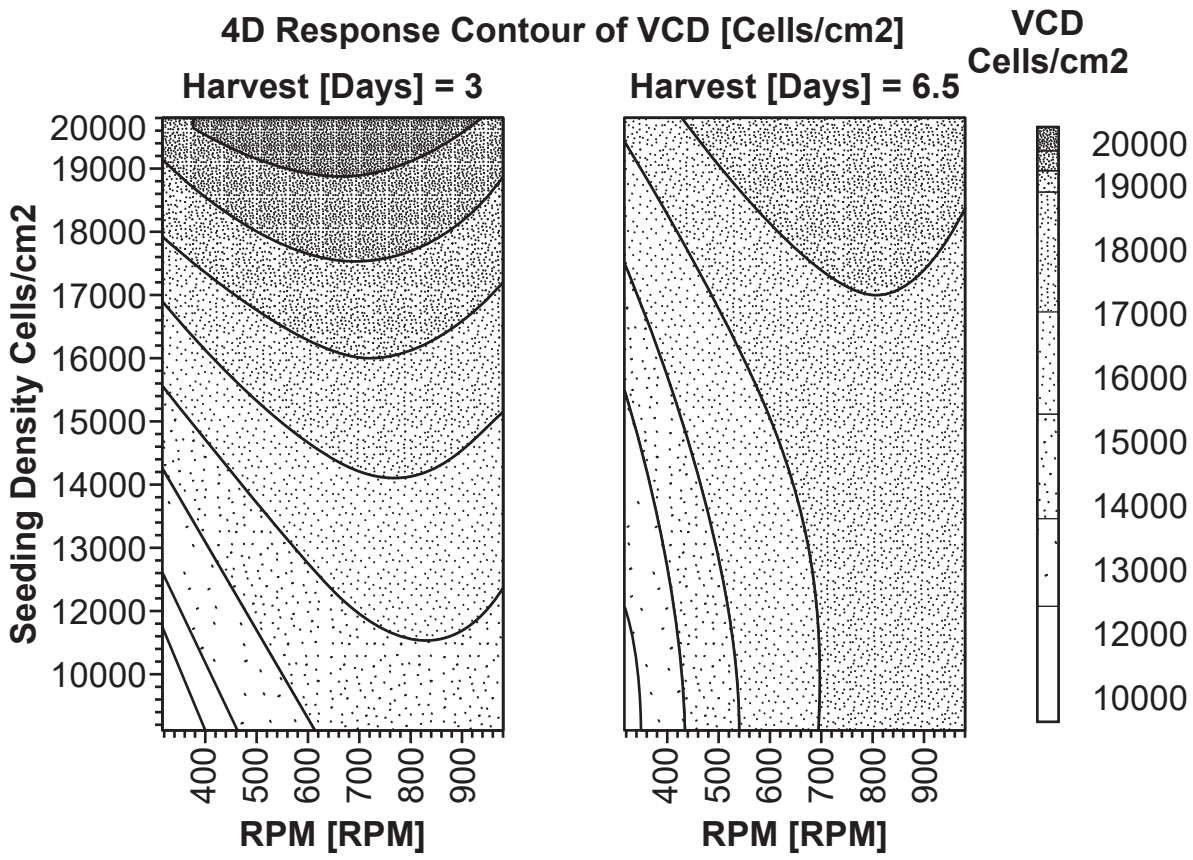
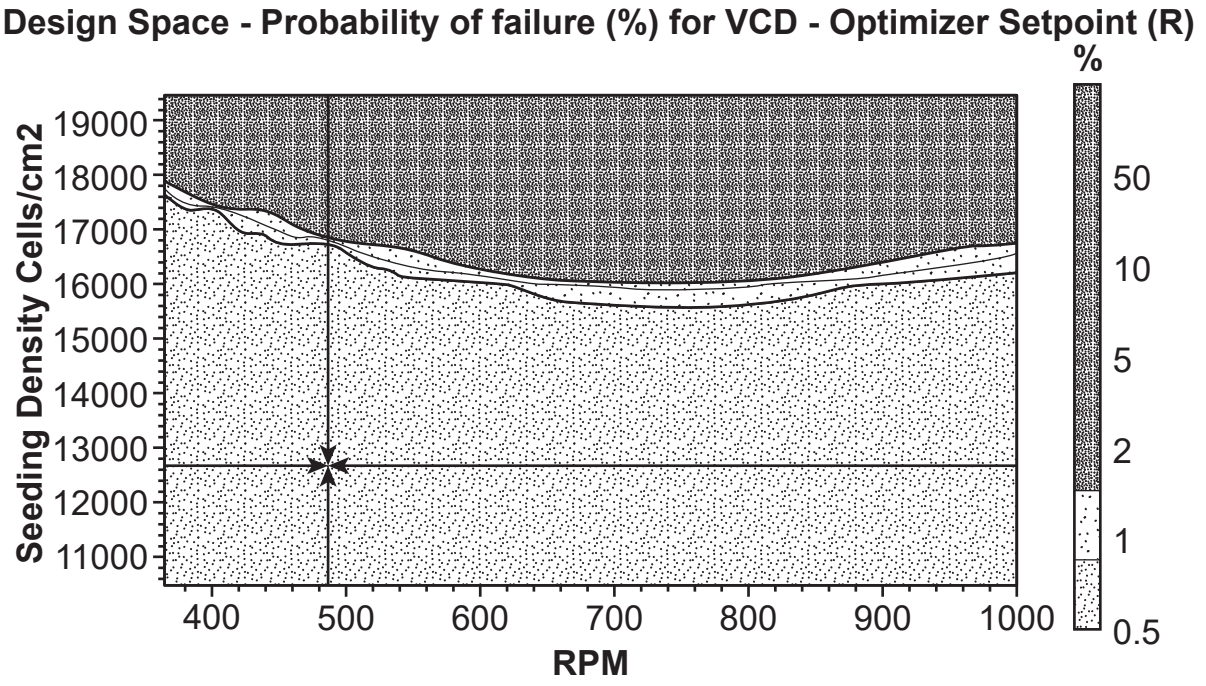

4D Response Contour of VCD [Cells/cm2]
Harvest [Days] = 3
Harvest [Days] = 6.5
VCD
Cells/cm2
Seeding Density Cells/cm2
20000
19000
18000
17000
16000
15000
14000
13000
12000
10000
400
500
600
700
800
900
RPM [RPM]
RPM [RPM]

FIG. 8

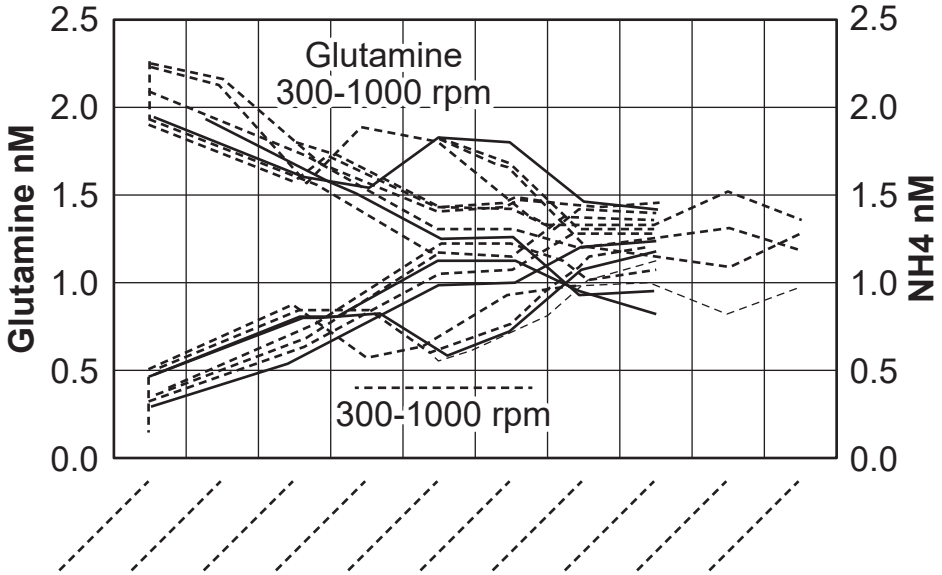


Factor	Value	Factor Contribution
RPM	487	48.3%
Seeding Density (Cells/cm2)	1267	42%
Peak Cell Density (Days Post Inoculation)	4	9.7%

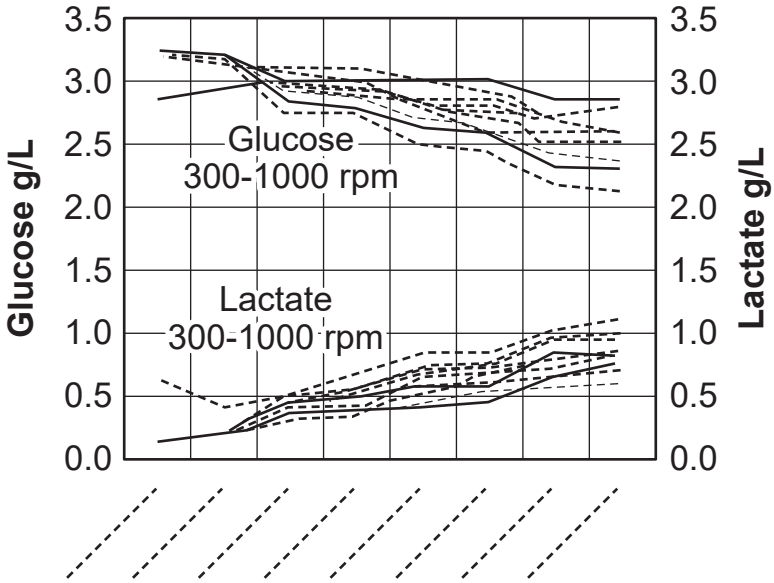
FIG. 9

2.4E4 cells/cm2 Seeding Density RPM Comparison

2.4E4 Cells/cm2 Seeding Density RPM Comparison
Glutamine and NH4 Flex2 Results



2.4E4 Cells/cm2 Seeding Density RPM Comparison
Glucose and Lactate Flex2 Results



2.4E4 Cells/cm2 Seeding Density RPM Comparison
O2 and CO2 Saturation Flex2 Results

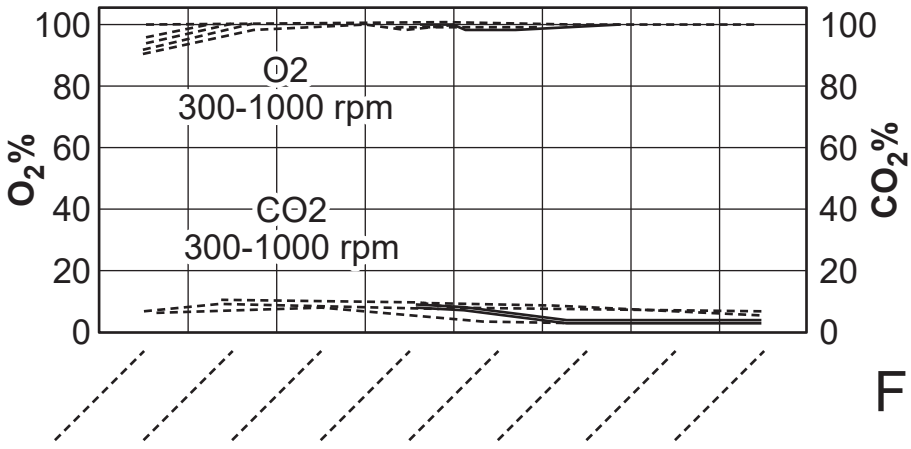


FIG. 10A

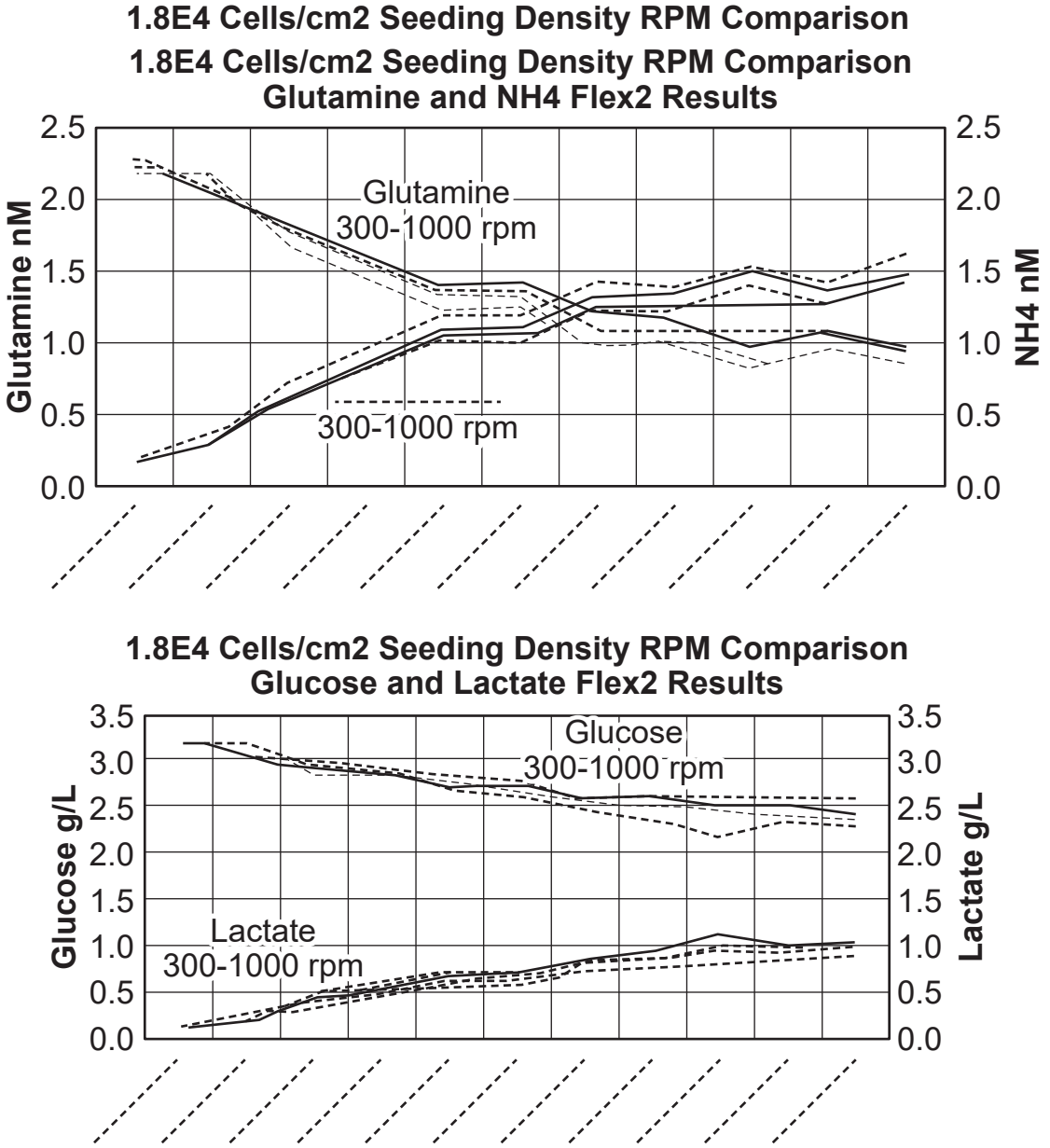
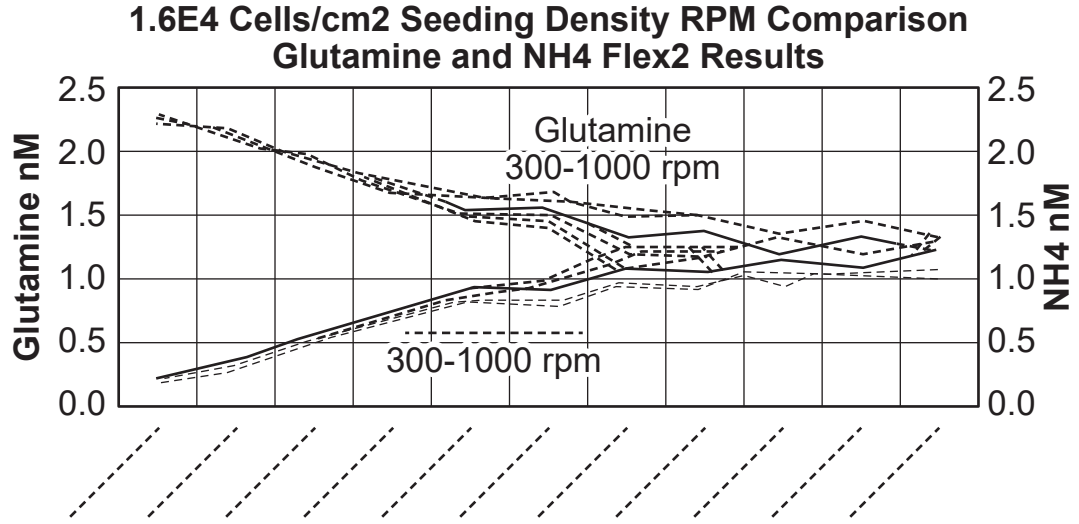
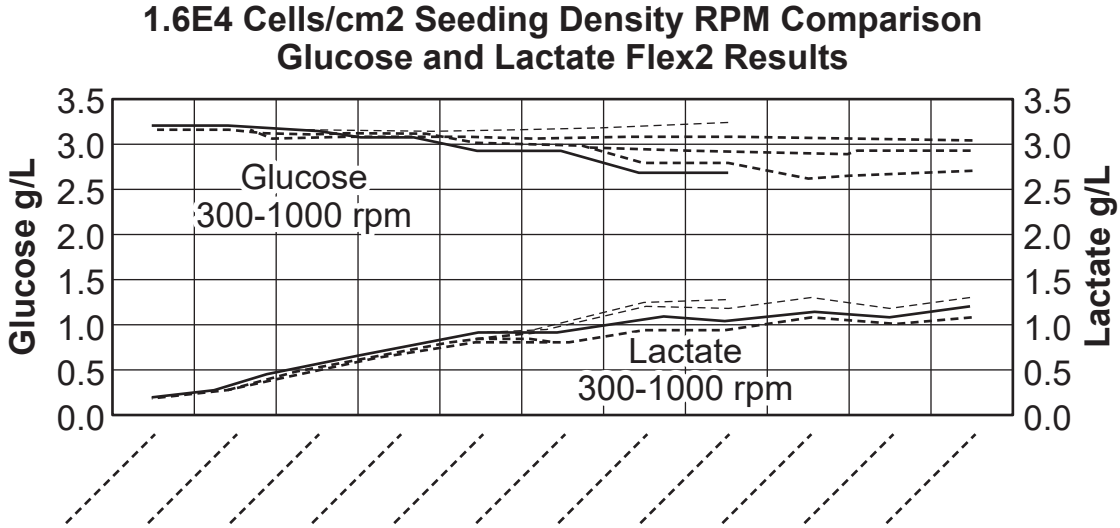

1.8E4 Cells/cm2 Seeding Density RPM Comparison
1.8E4 Cells/cm2 Seeding Density RPM Comparison
Glutamine and NH4 Flex2 Results
Glutamine nM
NH4 nM
Glutamine
300-1000 rpm
300-1000 rpm
2.5
2.0
1.5
1.0
0.5
0.0
1.8E4 Cells/cm2 Seeding Density RPM Comparison
Glucose and Lactate Flex2 Results
Glucose g/L
Lactate g/L
Glucose
300-1000 rpm
Lactate
300-1000 rpm
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1.8E4 Cells/cm2 Seeding Density RPM Comparison
O2 and CO2 Saturation Flex2 Results
O2%
CO2%
O2
300-1000 rpm
CO2
300-1000 rpm
100
80
60
40
20
0
90
70
50
30
10

FIG. 10B

1.6E4 cells/cm2 Seeding Density RPM Comparison





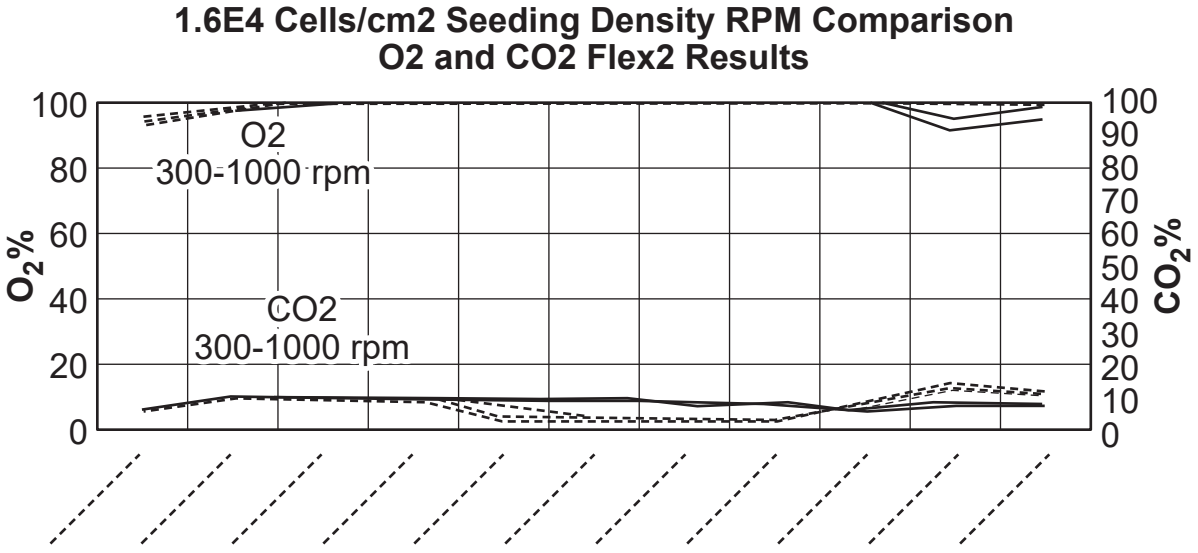


FIG. 10C

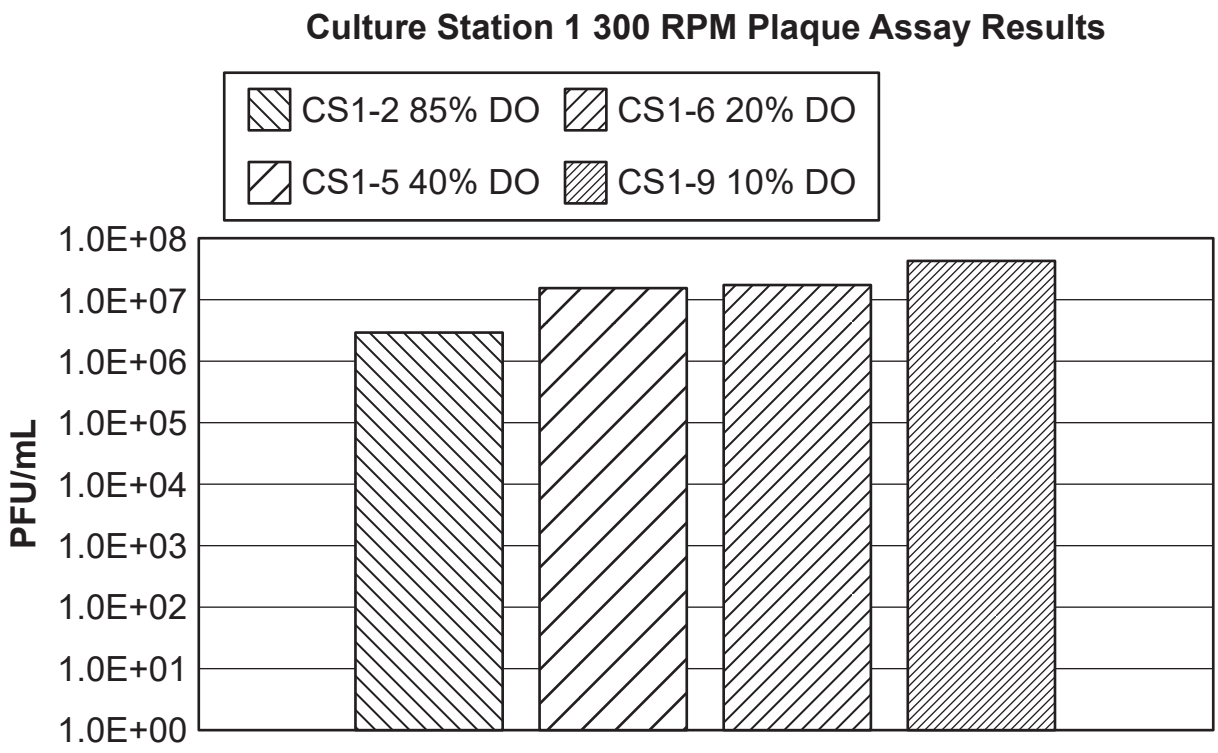

Culture Station 1 300 RPM Plaque Assay Results
CS1-2 85% DO
CS1-6 20% DO
CS1-5 40% DO
CS1-9 10% DO
PFU/mL
1.0E+08
1.0E+07
1.0E+06
1.0E+05
1.0E+04
1.0E+03
1.0E+02
1.0E+01
1.0E+00

FIG. 11

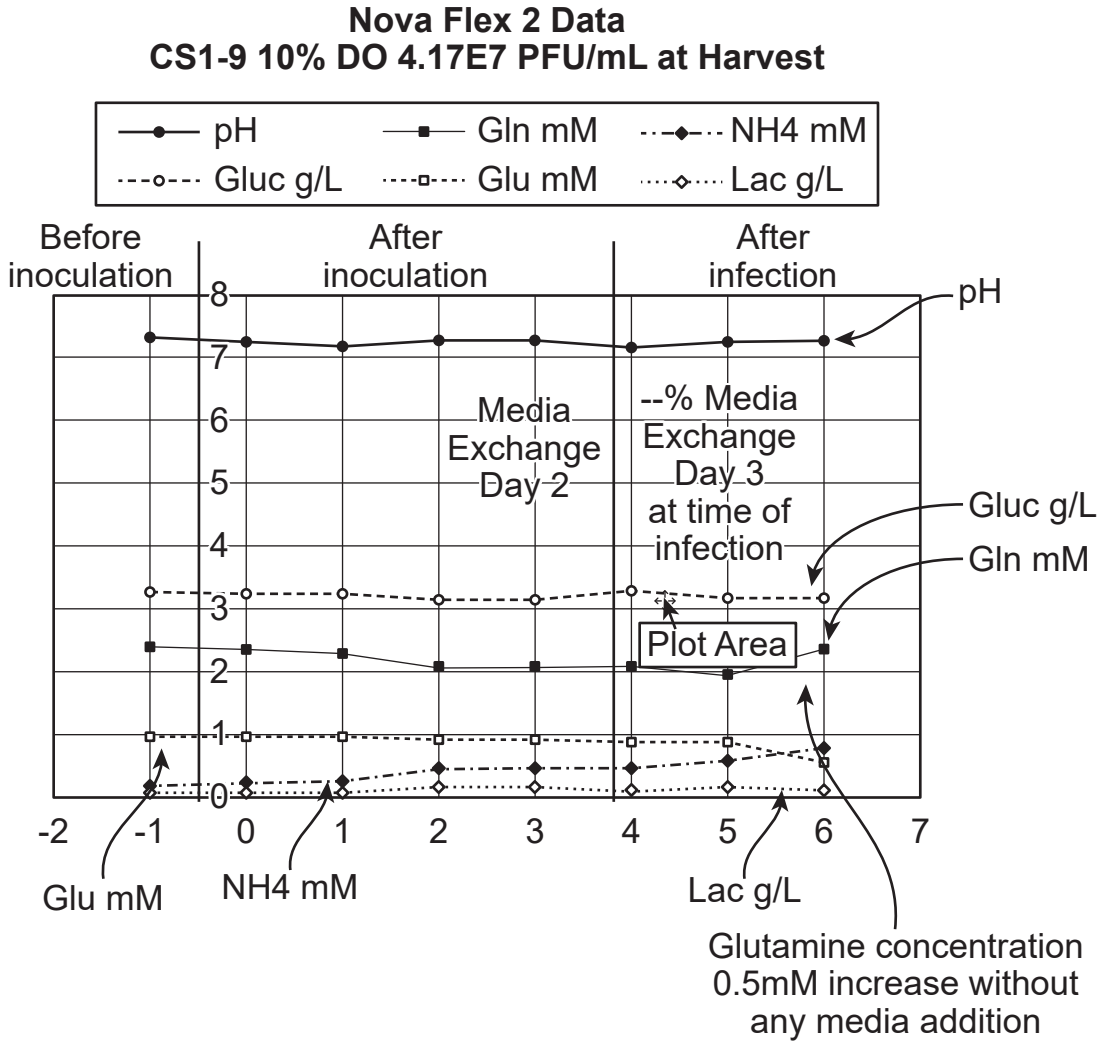

Nova Flex 2 Data
CS1-9 10% DO 4.17E7 PFU/mL at Harvest
pH
Gln mM
NH4 mM
Gluc g/L
Glu mM
Lac g/L
Before inoculation
After inoculation
After infection
Media Exchange Day 2
--% Media Exchange Day 3 at time of infection
Plot Area
pH
Gluc g/L
Gln mM
Glu mM
NH4 mM
Lac g/L
Glutamine concentration 0.5mM increase without any media addition

FIG. 12A

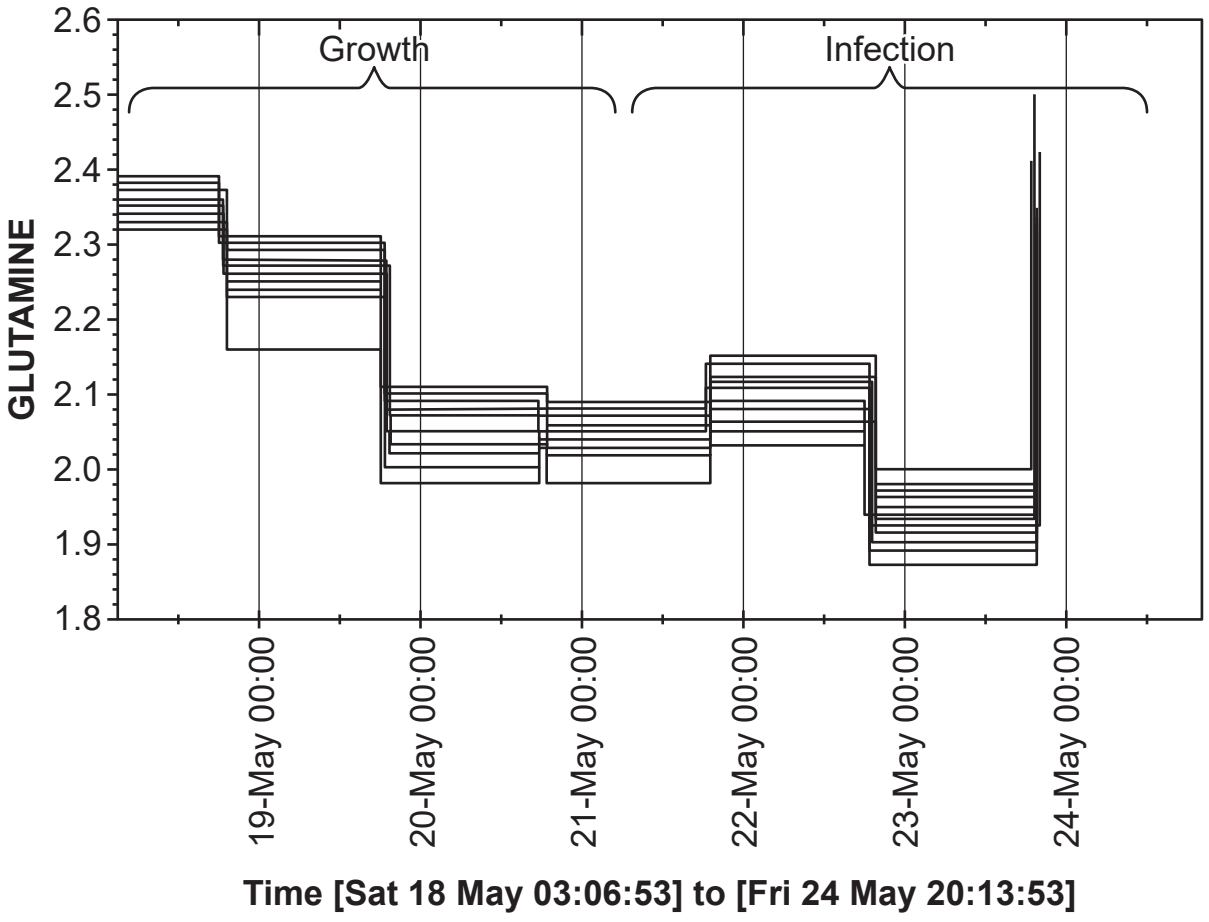

Growth
Infection
GLUTAMINE
2.6
2.5
2.4
2.3
2.2
2.1
2.0
1.9
1.8
19-May 00:00
20-May 00:00
21-May 00:00
22-May 00:00
23-May 00:00
24-May 00:00
Time [Sat 18 May 03:06:53] to [Fri 24 May 20:13:53]

FIG. 12B