

ĐẠI HỌC ĐÀ NẴNG  
TRƯỜNG ĐẠI HỌC BÁCH KHOA

NGUYỄN THỊ BÍCH HẰNG

THU NHẬN, ĐÁNH GIÁ HOẠT TÍNH PREBIOTIC CỦA  
POLYSACCHARIDE TỪ SỢI NẤM (*Cordyceps militaris*, *Trametes  
versicolor*) VÀ BƯỚC ĐẦU ỨNG DỤNG SINH KHỐI TRONG  
CHẾ BIẾN THỰC PHẨM BỔ SUNG

LUẬN ÁN TIẾN SĨ KỸ THUẬT  
PHẦN PHỤ LỤC

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## MỤC LỤC

PHỤ LỤC 1. CÔNG THỨC CÁC MÔI TRƯỜNG NUÔI CẤY .....	1
1.1. Môi trường PDB <sup>+</sup> .....	1
1.2. Môi trường M9 .....	1
1.3. Môi trường MRS borth.....	2
1.4. Môi trường LB.....	2
1.5. Môi trường NA .....	2
PHỤ LỤC 2. XỬ LÝ SỐ LIỆU TỐI ƯU ĐIỀU KIỆN THU SINH KHỐI TỪ SỢI NẤM GIÀU POLYSACCHARIDE.....	3
2.1. Ảnh hưởng của một số điều kiện nuôi cấy đến sinh khối hệ sợi nấm <i>C. militaris</i> .....	3
2.2. Tối ưu điều kiện nuôi cấy sinh khối hệ sợi nấm <i>C. militaris</i> .....	6
2.3. Ảnh hưởng của một số điều kiện nuôi cấy đến sinh khối hệ sợi nấm <i>T. Versicolor</i> .....	8
2.4. Tối ưu điều kiện nuôi cấy sinh khối hệ sợi nấm <i>T. versicolor</i> .....	11
PHỤ LỤC 3. XỬ LÝ SỐ LIỆU TÁCH CHIẾT TUẦN TỰ VÀ ĐÁNH GIÁ HÌNH THÁI, HOẠT TÍNH KHÁNG OXI HOÁ, PREBIOTIC CỦA CÁC CHIẾT XUẤT PS.....	13
3.1. Hàm lượng PS chiết xuất từ nấm.....	13
3.2. Khảo sát khả năng kích thích sự sinh trưởng các probiotic của các phân đoạn PS nấm <i>C. militaris</i> .....	14
3.3. Khảo sát khả năng kích thích sự sinh trưởng các probiotic của các chiết xuất PS nấm <i>T. versicolor</i> .....	20
3.4. Chỉ số prebiotic các chiết xuất PS nấm <i>T. versicolor</i> .....	26
3.5. Khảo sát khả năng kháng tiêu hoá các PS nấm .....	31
3.6. Khả năng chống lại vi khuẩn gây hại của môi trường nuôi cấy <i>L. plantarum</i> WCFS1 bổ sung PS chiết xuất từ nấm <i>C. militaris</i> .....	32

3.7. Khả năng chống lại vi khuẩn gây hại của môi trường nuôi cấy <i>L. plantarum</i> WCFS1 bổ sung PS chiết xuất từ nấm <i>T. versicolor</i> .....	36
3.8. Hàm lượng SCFA tạo ra khi nuôi probiotic trong môi trường bổ sung PS chiết xuất sợi nấm <i>T. versicolor</i> .....	40
3.9. Hàm lượng SCFA tạo ra khi nuôi probiotic trong môi trường bổ sung PS chiết xuất sợi nấm <i>C. militaris</i> .....	55
PHỤ LỤC 4. XỬ LÝ SỐ LIỆU ỨNG DỤNG SỢI NẤM CHẾ BIẾN NƯỚC NẤM BÀO NGƯ LÊN MEN LACTIC .....	70
4.1. Sự thay đổi tổng hàm lượng các chất hòa tan Brix .....	70
4.2. Sự thay đổi tổng hàm lượng pH .....	75
4.3. Sự thay đổi tổng hàm lượng TAN .....	80
4.4. Khả năng kháng oxi hoá của nước nấm Bào ngư lên men .....	85
4.5. Khả năng kích thích sự tăng trưởng đối với lợi khuẩn .....	89
4.6. Khả năng ức chế hại khuẩn .....	93
4.6.1. Ức chế <i>S. aureus</i> .....	93
4.6.2. Ức chế <i>E. coli</i> .....	96
4.7. Số liệu điểm đánh giá cảm quan .....	99
PHỤ LỤC 5. HÌNH ẢNH THÍ NGHIỆM .....	108
5.1. Sợi nấm <i>C. militaris</i> nuôi cấy lỏng .....	108
5.2. Bột sợi nấm sấy khô .....	109
5.3. Lên men nước Lactic sợi nấm Vân chi .....	110
5.4. Hình ảnh vi khuẩn phương đánh giá prebiotic .....	110
5.5. Tủ nuôi kỵ khí đánh giá hoạt tính prebiotic PS .....	111
5.6. Tách chiết PS từ nấm .....	111

5.7. Máy UV-Vis.....	111
5.8. Các phân đoạn PS tách chiết từ sợi nấm .....	112
5.9. Đường chuẩn glucose của phương pháp phenol-sulfuric .....	112
5.10. Đường chuẩn DNS .....	113
5.11. Sắc ký đồ SCFAs nuôi cấy probiotic bổ sung chiết xuất PS nấm <i>C. militaris</i> .....	114
5.12. Sắc ký đồ SCFAs nuôi cấy probiotic bổ sung chiết xuất PS nấm <i>T. versicolor</i> .....	118
5.13. Cây trải đĩa xác định mật độ tế bào .....	124
5.14. Khả năng bắt gốc tự do ABTS <sup>+</sup> .....	125
5.15. Nước lên men lactic.....	125
5.16. Phiếu đánh giá nước lên men lactic.....	126

## PHỤ LỤC 1. CÔNG THỨC CÁC MÔI TRƯỜNG NUÔI CẤY

### 1.1. Môi trường PDB<sup>+</sup>

Khoai tây : 200g

Glucose : 20g

Cao nấm men : 2g

Peptone : 2g

H<sub>2</sub>O : 1L

### 1.2. Môi trường M9

1. Chuẩn bị dung dịch muối M9 5X:

Chuẩn bị 400mL ddH<sub>2</sub>O cho vào bình định mức, lần lượt thêm:

a. 64g Na<sub>2</sub>HPO<sub>4</sub>·7H<sub>2</sub>O

b. 15g KH<sub>2</sub>PO<sub>4</sub>

c. 2,5g NaCl

d. 5.0g NH<sub>4</sub>Cl

Chuẩn đến vạch định mức 1L với ddH<sub>2</sub>O Khử trùng bằng nồi hấp tiệt trùng

2. Chuẩn bị dung dịch MgSO<sub>4</sub> 1M:

Cân 24,65g MgSO<sub>4</sub>·7H<sub>2</sub>O chuẩn đến 100mL

3. Chuẩn bị dung dịch glucose 40% (w/v):

Cân 40 g glucose chuẩn đến 100 mL bằng nước cất/khử ion Chú ý: Thêm glucose vào nước khuấy trong cốc; đừng thêm nước vào Glucose.

4. Chuẩn bị dung dịch CaCl<sub>2</sub> 1M:

Đổ 100 mL ddH<sub>2</sub>O thêm: 147.014g CaCl<sub>2</sub>·2ddH<sub>2</sub>O. Thực hiện đến 1L với ddH<sub>2</sub>O

5. Phương pháp chuẩn bị (1L môi trường) M9:

- a. 200 mL dung dịch muối M9 5X
- b. 800 mL ddH<sub>2</sub>O
- c. 2 mL dung dịch MgSO<sub>4</sub> 1M
- d. 0,1 mL dung dịch CaCl<sub>2</sub> 1M
- e. 10 mL glucose 40%

### 1.3. Môi trường MRS borth

Glucose	: 20g
Pepton	: 20g
Cao nấm men	: 5g
K <sub>2</sub> HPO <sub>4</sub>	: 2g
CH <sub>3</sub> COONa	: 5g
Triammonium Citrate:	2g
MgSO <sub>4</sub>	: 0,25g
MnSO <sub>4</sub>	: 0,02g
H <sub>2</sub> O	: 1L

### 1.4. Môi trường LB

Pepton: 10g

Cao nấm men: 5g

Nacl: 10g

### 1.5. Môi trường NA

Pepton: 5g

Cao nấm men: 3g

Nacl: 5g

## PHỤ LỤC 2. XỬ LÝ SỐ LIỆU TỐI ƯU ĐIỀU KIỆN THU SINH KHỐI TỪ SỢI NẤM GIÀU POLYSACCHARIDE

### 2.1. Ảnh hưởng của một số điều kiện nuôi cấy đến sinh khối hệ sợi nấm *C. militaris*

PH

#### One-way ANOVA: pH

##### Method

Null hypothesis All means are equal  
Alternative hypothesis Not all means are equal  
Significance level  $\alpha = 0,05$

*Equal variances were assumed for the analysis.*

##### Factor Information

Factor	Levels	Values
NT	5	4,0, 4,5, 5,0, 5,5, 6,0

##### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
NT	4	2,95264	0,738160	380,49	0,000
Error	10	0,01940	0,001940		
Total	14	2,97204			

##### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0,0440454	99,35%	99,09%	98,53%

##### Means

NT	N	Mean	StDev	95% CI
4,0	3	4,1133	0,0569	(4,0567, 4,1700)
4,5	3	4,5833	0,0651	(4,5267, 4,6400)
5,0	3	5,42000	0,01000	(5,36334, 5,47666)
5,5	3	5,0533	0,0416	(4,9967, 5,1100)
6,0	3	4,9400	0,0200	(4,8833, 4,9967)

*Pooled StDev = 0,0440454*

##### Tukey Pairwise Comparisons

##### Grouping Information Using the Tukey Method and 95% Confidence

NT	N	Mean	Grouping
5,0	3	5,42000	A
5,5	3	5,0533	B
6,0	3	4,9400	B
4,5	3	4,5833	C
4,0	3	4,1133	D

*Means that do not share a letter are significantly different.*

## One-way ANOVA: Glu

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0,05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
NT	5	30. 35. 40. 45. 50

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
NT	4	2,980	0,7451	6,81	0,007
Error	10	1,094	0,1094		
Total	14	4,074			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0,330787	73,14%	62,40%	39,58%

### Means

NT	N	Mean	StDev	95% CI
30	3	4,430	0,500	(4,004, 4,856)
35	3	4,503	0,455	(4,078, 4,929)
40	3	5,630	0,240	(5,204, 6,056)
45	3	5,1933	0,1716	(4,7678, 5,6189)
50	3	4,9933	0,0513	(4,5678, 5,4189)

*Pooled StDev = 0,330787*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

NT	N	Mean	Grouping
40	3	5,630	A
45	3	5,1933	A B
50	3	4,9933	A B
35	3	4,503	B
30	3	4,430	B

*Means that do not share a letter are significantly different.*



## One-way ANOVA: Biomass versus NT

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
NT	5	4.0, 4.5, 5.0, 5.5, 6.0

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
NT	4	6.3252	1.58131	49.93	0.000
Error	10	0.3167	0.03167		
Total	14	6.6420			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.177970	95.23%	93.32%	89.27%

### Means

NT	N	Mean	StDev	95% CI
4.0	3	5.7600	0.0900	(5.5311, 5.9889)
4.5	3	6.0600	0.1600	(5.8311, 6.2889)
5.0	3	7.470	0.230	(7.241, 7.699)
5.5	3	6.2533	0.0751	(6.0244, 6.4823)
6.0	3	5.663	0.257	(5.434, 5.892)

*Pooled StDev = 0.177970*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

NT	N	Mean	Grouping
5.0	3	7.470	A
5.5	3	6.2533	B
4.5	3	6.0600	B C
4.0	3	5.7600	C
6.0	3	5.663	C

*Means that do not share a letter are significantly different.*

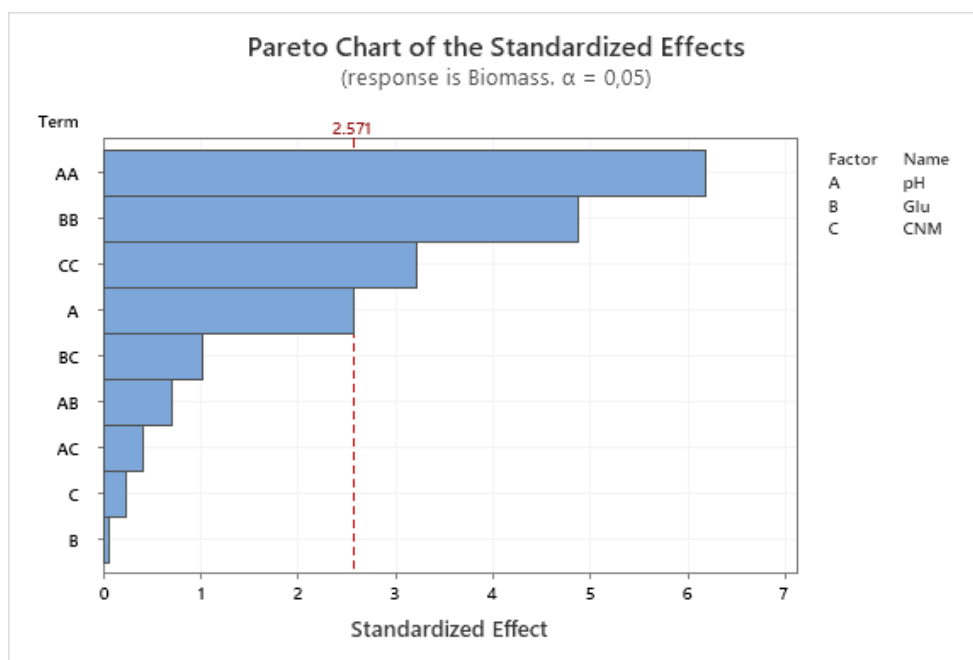
## 2.2. Tối ưu điều kiện nuôi cấy sinh khối hệ sợi nấm *C. militaris*

**Bảng 2.1. Các yếu tố và mức độ thử nghiệm trong Box - Behnken**

Các biến độc lập	Mức độ thử nghiệm		
	-1	0	1
pH ( $X_1$ )	4	5	6
Glucose g/L ( $X_2$ )	30	40	50
Cao nấm men g/L ( $X_3$ )	4	5	6

**Bảng 2.2. Giá trị phân tích xác suất các biến (khối lượng sinh khối)**

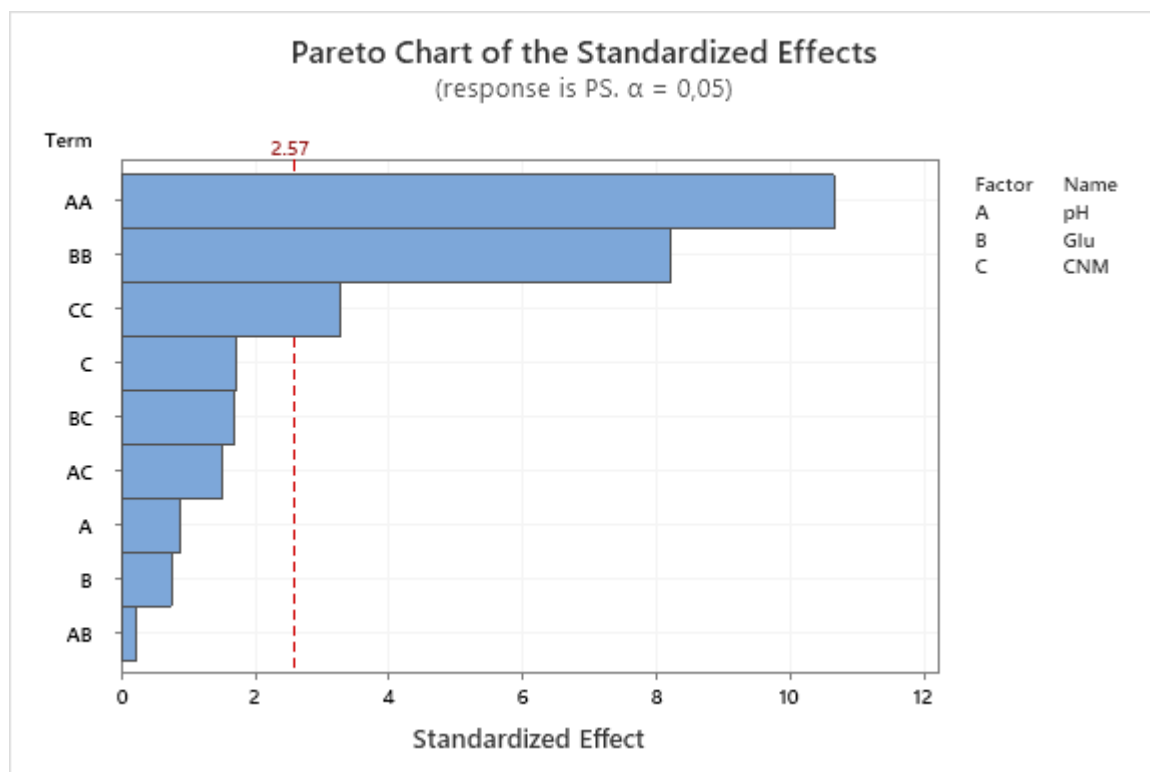
Biến độc lập	Coef	Coef SE	T.value	P-value
$X_1$	0,729	0,283	2,58	0,050
$X_2$	-0,016	0,283	-0,06	0,956
$X_3$	0,068	0,283	0,24	0,821
$X_1 \times X_1$	-2,575	0,416	-6,19	0,002
$X_2 \times X_2$	-2,035	0,416	-4,89	0,005
$X_3 \times X_3$	-1,342	0,416	-3,22	0,023
$X_1 \times X_2$	-0,283	0,400	-0,71	0,511
$X_1 \times X_3$	0,165	0,400	0,41	0,697
$X_2 \times X_3$	-0,410	0,400	-1,03	0,352



**Hình 2.1. Biểu đồ Pareto về các hiệu ứng chuẩn hóa đối với hàm lượng sinh khối**

Bảng 2.3. Giá trị phân tích xác suất các biến (Hàm lượng PS hệ sợi nấm)

Term	Coef	SE Coef	T-Value	P-Value
Constant	-46.33	6.63	-6.99	0.001
X <sub>1</sub>	10.47	1.43	7.35	0.001
X <sub>2</sub>	0.786	0.128	6.16	0.002
X <sub>3</sub>	3.82	1.43	2.68	0.044
X <sub>1</sub> ×X <sub>1</sub>	-1.138	0.121	-9.38	0.000
X <sub>2</sub> ×X <sub>2</sub>	-0.00885	0.00121	-7.30	0.001
X <sub>3</sub> ×X <sub>3</sub>	-0.377	0.121	-3.11	0.026
X <sub>1</sub> ×X <sub>2</sub>	0.0022	0.0116	0.19	0.854
X <sub>1</sub> ×X <sub>3</sub>	0.150	0.116	1.29	0.254
X <sub>2</sub> ×X <sub>3</sub>	-0.0167	0.0116	-1.44	0.210



Hình 2.2. Biểu đồ Pareto về các hiệu ứng chuẩn hóa đối với hàm lượng PS

## 2.3. Ảnh hưởng của một số điều kiện nuôi cấy đến sinh khối hệ sợi nấm *T. Versicolor*

GLUCOSE G.L

### One-way ANOVA: Glu

#### Method

Null hypothesis All means are equal  
Alternative hypothesis Not all means are equal  
Significance level  $\alpha = 0,05$

*Equal variances were assumed for the analysis.*

#### Factor Information

Factor	Levels	Values
NT	5	10. 15. 20. 25. 30

#### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
NT	4	1,8974	0,47435	43,39	0,000
Error	10	0,1093	0,01093		
Total	14	2,0067			

#### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0,104551	94,55%	92,37%	87,74%

#### Means

NT	N	Mean	StDev	95% CI
10	3	2,4197	0,0599	(2,2852, 2,5542)
15	3	3,1750	0,0300	(3,0405, 3,3095)
20	3	3,4290	0,0300	(3,2945, 3,5635)
25	3	2,825	0,200	(2,691, 2,959)
30	3	2,6973	0,0962	(2,5628, 2,8318)

*Pooled StDev = 0,104551*

#### Tukey Pairwise Comparisons

##### Grouping Information Using the Tukey Method and 95% Confidence

NT	N	Mean	Grouping
20	3	3,4290	A
15	3	3,1750	A
25	3	2,825	B
30	3	2,6973	B C
10	3	2,4197	C

*Means that do not share a letter are significantly different.*

## One-way ANOVA: pH

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0,05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
NT	5	4,0, 5,0, 5,5, 6,0, 6,5

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
NT	4	2,27213	0,568032	71,16	0,000
Error	10	0,07983	0,007983		
Total	14	2,35195			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0,0893450	96,61%	95,25%	92,36%

### Means

NT	N	Mean	StDev	95% CI
4,0	3	2,5150	0,1384	(2,4001, 2,6299)
5,0	3	2,8417	0,1351	(2,7267, 2,9566)
5,5	3	3,57533	0,00451	(3,46040, 3,69027)
6,0	3	3,3760	0,0185	(3,2611, 3,4909)
6,5	3	2,8310	0,0464	(2,7161, 2,9459)

*Pooled StDev = 0,0893450*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

NT	N	Mean	Grouping
5,5	3	3,57533	A
6,0	3	3,3760	A
5,0	3	2,8417	B
6,5	3	2,8310	B
4,0	3	2,5150	C

*Means that do not share a letter are significantly different.*

## One-way ANOVA: CNM

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0,05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
NT	5	1,0, 1,5, 2,0, 2,5, 3,0

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
NT	4	4,4044	1,10110	27,11	0,000
Error	10	0,4062	0,04062		
Total	14	4,8106			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0,201540	91,56%	88,18%	81,00%

### Means

NT	N	Mean	StDev	95% CI
1,0	3	2,0960	0,0878	(1,8367, 2,3553)
1,5	3	2,511	0,432	(2,252, 2,770)
2,0	3	3,6710	0,0620	(3,4117, 3,9303)
2,5	3	3,1810	0,0642	(2,9217, 3,4403)
3,0	3	2,9143	0,0282	(2,6551, 3,1736)

*Pooled StDev = 0,201540*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

NT	N	Mean	Grouping
2,0	3	3,6710	A
2,5	3	3,1810	A B
3,0	3	2,9143	B C
1,5	3	2,511	C D
1,0	3	2,0960	D

*Means that do not share a letter are significantly different.*

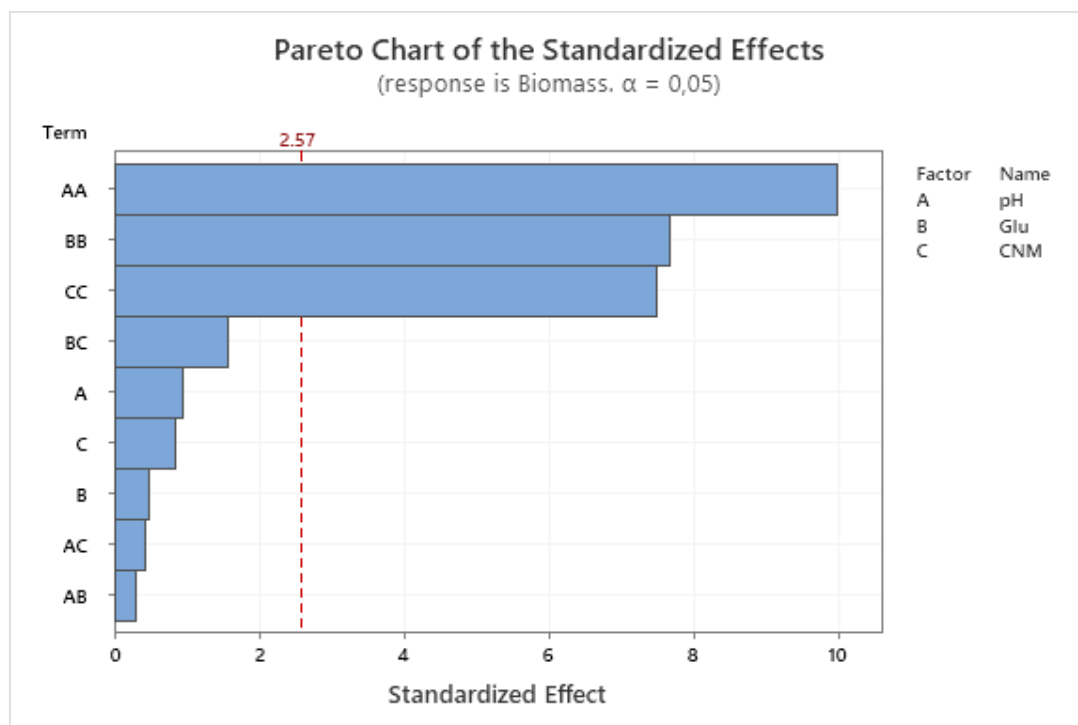
## 2.4. Tối ưu điều kiện nuôi cấy sinh khối hệ sợi nấm *T. versicolor*

**Bảng 2.4. Các yếu tố và mức độ thử nghiệm trong Box - Behnken**

Các biến độc lập	Mức độ thử nghiệm		
	-1	0	1
pH (X1)	5	5,5	6
Glucose g/L (X2)	15	20	25
Cao nấm men g/L (X3)	1,5	2	2,5

**Bảng 2.5. Giá trị phân tích xác suất các biến (sinh khối)**

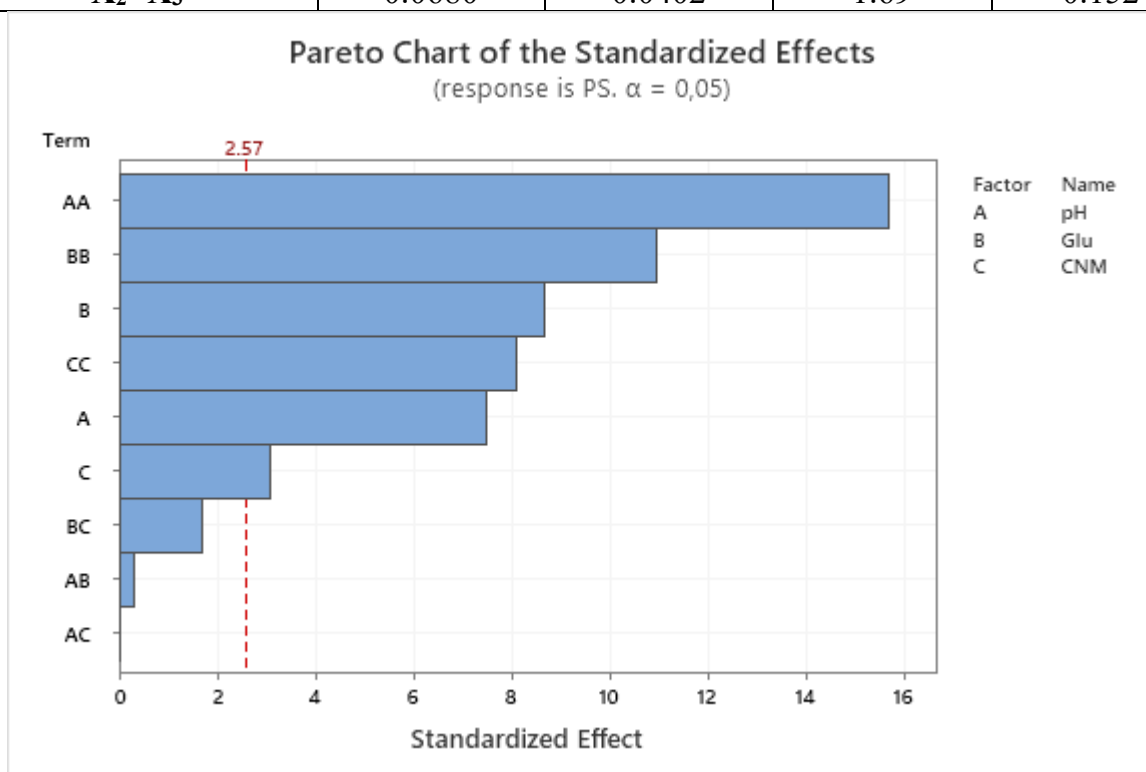
Term	Coef	SE Coef	T-Value	P-Value
Constant	-109,1	11,0	-9,94	0,000
X <sub>1</sub>	33,74	3,57	9,46	0,000
X <sub>2</sub>	0,997	0,217	4,59	0,006
X <sub>3</sub>	9,62	2,17	4,43	0,007
X <sub>1</sub> ×X <sub>1</sub>	-3,099	0,315	-9,85	0,000
X <sub>2</sub> ×X <sub>2</sub>	-0,02377	0,00315	-7,56	0,001
X <sub>3</sub> ×X <sub>3</sub>	-2,324	0,315	-7,39	0,001
X <sub>1</sub> ×X <sub>2</sub>	0,0096	0,0302	0,32	0,764
X <sub>1</sub> ×X <sub>3</sub>	0,129	0,302	0,43	0,687
X <sub>2</sub> ×X <sub>3</sub>	-0,0471	0,0302	-1,56	0,180



**Hình 2.3. Biểu đồ Pareto về các hiệu ứng chuẩn hóa đối với hàm lượng sinh khối**

**Bảng 2.6. Giá trị phân tích xác suất các biến (Hàm lượng PS hệ sợi nấm)**

Term	Coef	SE Coef	T-Value	P-Value
Constant	-227.9	14.6	-15.59	0.000
$X_1$	73.24	4.75	15.42	0.000
$X_2$	1.754	0.289	6.06	0.002
$X_3$	12.61	2.89	4.36	0.007
$X_1 \times X_1$	-6.587	0.419	-15.72	0.000
$X_2 \times X_2$	-0.04597	0.00419	-10.97	0.000
$X_3 \times X_3$	-3.397	0.419	-8.11	0.000
$X_1 \times X_2$	0.0130	0.0402	0.32	0.760
$X_1 \times X_3$	0.010	0.402	0.02	0.981
$X_2 \times X_3$	0.0680	0.0402	1.69	0.152



**Hình 2.4. Biểu đồ Pareto về các hiệu ứng chuẩn hóa đối với hàm lượng PS**



# PHỤ LỤC 3. XỬ LÝ SỐ LIỆU TÁCH CHIẾT TUẦN TỰ VÀ ĐÁNH GIÁ HÌNH THÁI, HOẠT TÍNH KHÁNG OXI HOÁ, PREBIOTIC CỦA CÁC CHIẾT XUẤT PS

## 3.1. Hàm lượng PS chiết xuất từ nấm

HÀM LƯỢNG PS

One-way ANOVA: ham luong versus nghiem thuc

### Method

Null hypothesis All means are equal  
Alternative hypothesis Not all means are equal  
Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
ngghiem thuc	6	A-PSC, A-PST, S-PSC, S-PST, W-PSC, W-PST

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
ngghiem thuc	5	17703.4	3540.68	430.26	0.000
Error	12	98.7	8.23		
Total	17	17802.2			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
2.86864	99.45%	99.21%	98.75%

### Means

ngghiem thuc	N	Mean	StDev	95% CI
A-PSC	3	13.32	3.46	(9.72, 16.93)
A-PST	3	5.467	0.701	(1.858, 9.075)
S-PSC	3	22.53	1.84	(18.92, 26.13)
S-PST	3	4.300	0.826	(0.691, 7.909)
W-PSC	3	81.35	4.22	(77.74, 84.96)
W-PST	3	71.53	3.88	(67.92, 75.14)

*Pooled StDev = 2.86864*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

ngghiem thuc	N	Mean	Grouping
W-PSC	3	81.35	A
W-PST	3	71.53	B
S-PSC	3	22.53	C
A-PSC	3	13.32	D
A-PST	3	5.467	D E
S-PST	3	4.300	E

*Means that do not share a letter are significantly different.*

3.2. Khảo sát khả năng kích thích sự sinh trưởng các probiotic của các phân đoạn PS  
nấm *C. militaris*

**Bảng 3.2.** Sự sinh trưởng các chủng lợi khuẩn bổ sung chiết xuất PS sau 24 giờ

Chủng	GF	Glucose	FOS	H <sub>2</sub> O	HCl	Na <sub>2</sub> CO <sub>3</sub>
<i>L. pentosus</i>	0.2564	0.7642	0.7573	0.7172	0.6830	0.3847
	0.2680	0.7785	0.7579	0.6877	0.7299	0.3250
	0.2691	0.7883	0.7600	0.6674	0.6855	0.4045
<i>L. plantarum</i>	0.2392	0.7577	0.4070	0.7219	0.7459	0.4435
	0.2384	0.7437	0.4114	0.6965	0.7174	0.3938
	0.2441	0.7421	0.5817	0.4387	0.7777	0.3966
<i>P. acidilactici</i>	0.3889	1.0543	0.7252	0.7784	0.5883	0.6158
	0.3898	1.0673	0.7307	0.6619	0.5605	0.5266
	0.3933	1.0704	0.7325	0.7335	0.7481	0.5492
<i>B. animalis</i>	0.1048	0.6914	0.6798	0.1376	0.2967	0.2451
	0.1066	0.6928	0.6345	0.2766	0.3059	0.1944
	0.1082	0.6873	0.6863	0.3002	0.2908	0.1750
<i>L. casein</i>	0.1252	0.6731	0.5657	0.4638	0.4842	0.1233
	0.1262	0.6733	0.5526	0.4819	0.4651	0.1247
	0.1231	0.6707	0.5591	0.4642	0.4656	0.1384

## One-way ANOVA: GF, G, W-PSC, A-PSC, S-PSC, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	6	GF, G, W-PSC, A-PSC, S-PSC, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	5	2.61926	0.523852	1590.03	0.000
Error	12	0.00395	0.000329		
Total	17	2.62321			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0181511	99.85%	99.79%	99.66%

### Means

Factor	N	Mean	StDev	95% CI
GF	3	0.16060	0.00685	(0.13777, 0.18343)
G	3	0.67820	0.01355	(0.65537, 0.70103)
W-PSC	3	0.6069	0.0198	(0.5841, 0.6298)
A-PSC	3	0.6316	0.0302	(0.6088, 0.6544)
S-PSC	3	0.2368	0.0206	(0.2140, 0.2596)
FOS	3	1.33577	0.00426	(1.31293, 1.35860)

*Pooled StDev = 0.0181511*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
FOS	3	1.33577	A
G	3	0.67820	B
A-PSC	3	0.6316	B C
W-PSC	3	0.6069	C
S-PSC	3	0.2368	D
GF	3	0.16060	E

*Means that do not share a letter are significantly different.*

## One-way ANOVA: GF, G, W-PSC, A-PSC, S-PSC, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	6	GF, G, W-PSC, A-PSC, S-PSC, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	5	0.70192	0.140384	21.55	0.000
Error	12	0.07816	0.006513		
Total	17	0.78008			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0807035	89.98%	85.81%	77.46%

### Means

Factor	N	Mean	StDev	95% CI
GF	3	0.13773	0.00359	(0.03621, 0.23925)
G	3	0.65517	0.01481	(0.55365, 0.75669)
W-PSC	3	0.5285	0.1673	(0.4269, 0.6300)
A-PSC	3	0.6717	0.0187	(0.5702, 0.7732)
S-PSC	3	0.2545	0.0308	(0.1530, 0.3561)
FOS	3	0.4175	0.0978	(0.3159, 0.5190)

*Pooled StDev = 0.0807035*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
A-PSC	3	0.6717	A
G	3	0.65517	A
W-PSC	3	0.5285	A B
FOS	3	0.4175	B C
S-PSC	3	0.2545	C D
GF	3	0.13773	D

*Means that do not share a letter are significantly different.*

## One-way ANOVA: GF, G, W-PSC, A-PSC, S-PSC, FOS

## Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

## Factor Information

## Factor Levels Values

Factor 6 GF, G, W-PSC, A-PSC, S-PSC, FOS

## Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	5	1.36290	0.272581	91.32	0.000
Error	12	0.03582	0.002985		
Total	17	1.39872			

## Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0546337	97.44%	96.37%	94.24%

## Means

Factor	N	Mean	StDev	95% CI
GF	3	0.34083	0.00250	(0.27211, 0.40956)
G	3	1.21060	0.00885	(1.14188, 1.27933)
W-PSC	3	0.6986	0.0606	(0.6298, 0.7673)
A-PSC	3	0.6201	0.1031	(0.5514, 0.6888)
S-PSC	3	0.4692	0.0589	(0.4005, 0.5380)
FOS	3	0.55773	0.00698	(0.48901, 0.62646)

*Pooled StDev = 0.0546337*

## Tukey Pairwise Comparisons

## Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
G	3	1.21060	A
W-PSC	3	0.6986	B
A-PSC	3	0.6201	B
FOS	3	0.55773	B C
S-PSC	3	0.4692	C D
GF	3	0.34083	D

*Means that do not share a letter are significantly different.*

## One-way ANOVA: GF, G, W-PSC, A-PSC, S-PSC, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	6	GF, G, W-PSC, A-PSC, S-PSC, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	5	0.62137	0.124274	75.24	0.000
Error	12	0.01982	0.001652		
Total	17	0.64119			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0406399	96.91%	95.62%	93.05%

### Means

Factor	N	Mean	StDev	95% CI
GF	3	0.02410	0.00272	(-0.02702, 0.07522)
G	3	0.57780	0.01234	(0.52668, 0.62892)
W-PSC	3	0.1431	0.0896	(0.0920, 0.1942)
A-PSC	3	0.22337	0.00490	(0.17224, 0.27449)
S-PSC	3	0.0742	0.0407	(0.0231, 0.1253)
FOS	3	0.07797	0.00644	(0.02684, 0.12909)

*Pooled StDev = 0.0406399*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
G	3	0.57780	A
A-PSC	3	0.22337	B
W-PSC	3	0.1431	B C
FOS	3	0.07797	C D
S-PSC	3	0.0742	C D
GF	3	0.02410	D

*Means that do not share a letter are significantly different.*

## One-way ANOVA: GF, G, W-PSC, A-PSC, S-PSC, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	6	GF, G, W-PSC, A-PSC, S-PSC, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	5	3.52753	0.705506	8343.43	0.000
Error	12	0.00101	0.000085		
Total	17	3.52855			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0091956	99.97%	99.96%	99.94%

### Means

Factor	N	Mean	StDev	95% CI
GF	3	0.05007	0.00186	(0.03850, 0.06163)
G	3	0.57497	0.00310	(0.56340, 0.58653)
W-PSC	3	0.38117	0.01204	(0.36960, 0.39273)
A-PSC	3	0.40457	0.01085	(0.39300, 0.41613)
S-PSC	3	0.01547	0.01190	(0.00390, 0.02703)
FOS	3	1.34753	0.00949	(1.33597, 1.35910)

*Pooled StDev = 0.00919556*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
FOS	3	1.34753	A
G	3	0.57497	B
A-PSC	3	0.40457	C
W-PSC	3	0.38117	C
GF	3	0.05007	D
S-PSC	3	0.01547	E

*Means that do not share a letter are significantly different.*

### 3.3. Khảo sát khả năng kích thích sự sinh trưởng các probiotic của các chiết xuất PS nấm *T. versicolor*

**Bảng 3.1.** Sự tăng trưởng của các chủng lợi khuẩn bổ sung chiết xuất sau 24 giờ

Chủng	FOS	Glucose	GF	H <sub>2</sub> O	HCl	Na <sub>2</sub> CO <sub>3</sub>
<i>B. animalis</i>	0,6798	0,6914	0,1019	0,4114	0,5891	0,2112
	0,6345	0,6928	0,1138	0,416	0,5904	0,209
	0,6863	0,6873	0,1224	0,4272	0,5894	0,2025
	0,6363	0,68564	0,09	0,4247	0,5873	0,2197
	0,6361	0,6943	0,1115	0,4287	0,5899	0,2226
	0,6381	0,7213	0,1227	0,433	0,5864	0,2236
<i>L. casein</i>	0,5657	0,6731	0,1245	0,4055	0,6346	0,1757
	0,5526	0,6733	0,1378	0,4167	0,6451	0,1728
	0,5591	0,6707	0,1274	0,4221	0,6543	0,1363
	0,5643	0,6821	0,1252	0,3744	0,6936	0,1214
	0,5743	0,6796	0,1262	0,3818	0,7076	0,1301
	0,5578	0,6767	0,1231	0,3832	0,7058	0,138
<i>P. acidilactici</i>	0,7112	1,05429	0,3889	0,4834	0,7078	0,4532
	0,7123	1,06732	0,3898	0,4832	0,71	0,4357
	0,713	1,0704	0,3933	0,4818	0,7162	0,4634
	0,7252	1,121	0,3672	0,4841	0,7165	0,4689
	0,7307	1,021	0,3908	0,4827	0,7212	0,4734
	0,7325	0,9987	0,3878	0,4853	0,7205	0,4554
<i>L. pentosus</i>	0,7573	0,7642	0,25643	0,534	0,677	0,5857
	0,7579	0,7785	0,26802	0,5371	0,6822	0,5878
	0,76	0,7883	0,26908	0,5388	0,6819	0,6083
	0,7633	0,823	0,26392	0,5387	0,6664	0,6103
	0,7784	0,757	0,26008	0,5406	0,6737	0,5988
	0,781	0,7769	0,26074	0,5405	0,6757	0,6001
<i>L. plantarum</i>	0,407	0,7577	0,23921	0,5733	0,6411	0,5325
	0,4114	0,7437	0,23842	0,5791	0,6399	0,536
	0,5817	0,7421	0,24413	0,5813	0,6422	0,5353
	0,474	0,7613	0,26653	0,5763	0,6439	0,5285
	0,473	0,7537	0,26342	0,582	0,6443	0,5324
	0,532	0,7672	0,26444	0,6444	0,5794	0,5369



## One-way ANOVA: FOS, Glu, GF, W-PST, A-PST, S-PST

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

#### Factor Levels Values

Factor	Levels	Values
Factor	6	FOS, Glu, GF, W-PST, A-PST, S-PST

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	5	1.74949	0.349898	1977.75	0.000
Error	30	0.00531	0.000177		
Total	35	1.75480			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0133010	99.70%	99.65%	99.56%

### Means

Factor	N	Mean	StDev	95% CI
FOS	6	0.65185	0.02428	(0.64076, 0.66294)
Glu	6	0.69546	0.01308	(0.68437, 0.70655)
GF	6	0.11038	0.01262	(0.09929, 0.12147)
W-PST	6	0.42350	0.00819	(0.41241, 0.43459)
A-PST	6	0.588750	0.001563	(0.577660, 0.599840)
S-PST	6	0.21477	0.00849	(0.20368, 0.22586)

*Pooled StDev = 0.0133010*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
Glu	6	0.69546	A
FOS	6	0.65185	B
A-PST	6	0.588750	C
W-PST	6	0.42350	D
S-PST	6	0.21477	E
GF	6	0.11038	F

*Means that do not share a letter are significantly different.*

## One-way ANOVA: FOS, Glu, GF, W-PST, A-PST, S-PST

## Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

## Factor Information

## Factor Levels Values

Factor	Levels	Values
Factor	6	FOS, Glu, GF, W-PST, A-PST, S-PST

## Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	5	0.86486	0.172972	210.28	0.000
Error	30	0.02468	0.000823		
Total	35	0.88954			

## Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0286806	97.23%	96.76%	96.01%

## Means

Factor	N	Mean	StDev	95% CI
FOS	6	0.4799	0.0681	(0.4559, 0.5038)
Glu	6	0.75428	0.00988	(0.73037, 0.77820)
GF	6	0.25269	0.01344	(0.22878, 0.27660)
W-PST	6	0.57857	0.00326	(0.55465, 0.60248)
A-PST	6	0.642633	0.001872	(0.618721, 0.666546)
S-PST	6	0.53360	0.00310	(0.50969, 0.55751)

*Pooled StDev = 0.0286806*

## Tukey Pairwise Comparisons

## Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
Glu	6	0.75428	A
A-PST	6	0.642633	B
W-PST	6	0.57857	C
S-PST	6	0.53360	C
FOS	6	0.4799	D
GF	6	0.25269	E

*Means that do not share a letter are significantly different.*

## One-way ANOVA: FOS, Glu, GF, W-PST, A-PST, S-PST

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	6	FOS, Glu, GF, W-PST, A-PST, S-PST

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	5	1.10155	0.220310	1612.46	0.000
Error	30	0.00410	0.000137		
Total	35	1.10565			

### Model Summary

	S	R-sq	R-sq(adj)	R-sq(pred)
	0.0116889	99.63%	99.57%	99.47%

### Means

Factor	N	Mean	StDev	95% CI
FOS	6	0.76632	0.01061	(0.75657, 0.77606)
Glu	6	0.78132	0.02323	(0.77157, 0.79106)
GF	6	0.26305	0.00489	(0.25330, 0.27279)
W-PST	6	0.53828	0.00247	(0.52854, 0.54803)
A-PST	6	0.67615	0.00586	(0.66640, 0.68590)
S-PST	6	0.59850	0.01016	(0.58875, 0.60825)

*Pooled StDev = 0.0116889*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
Glu	6	0.78132	A
FOS	6	0.76632	A
A-PST	6	0.67615	B
S-PST	6	0.59850	C
W-PST	6	0.53828	D
GF	6	0.26305	E

*Means that do not share a letter are significantly different.*

## One-way ANOVA: FOS, Glu, GF, W-PST, A-PST, S-PST

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

#### Factor Levels Values

Factor 6 FOS, Glu, GF, W-PST, A-PST, S-PST

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	5	1.83977	0.367953	996.99	0.000
Error	30	0.01107	0.000369		
Total	35	1.85084			

### Model Summary

	S	R-sq	R-sq(adj)	R-sq(pred)
	0.0192110	99.40%	99.30%	99.14%

### Means

Factor	N	Mean	StDev	95% CI
FOS	6	0.72082	0.00979	(0.70480, 0.73683)
Glu	6	1.0555	0.0426	(1.0394, 1.0715)
GF	6	0.38630	0.00954	(0.37028, 0.40232)
W-PST	6	0.483417	0.001199	(0.467399, 0.499434)
A-PST	6	0.71537	0.00545	(0.69935, 0.73138)
S-PST	6	0.45833	0.01350	(0.44232, 0.47435)

*Pooled StDev = 0.0192110*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
Glu	6	1.0555	A
FOS	6	0.72082	B
A-PST	6	0.71537	B
W-PST	6	0.483417	C
S-PST	6	0.45833	C
GF	6	0.38630	D

*Means that do not share a letter are significantly different.*

## One-way ANOVA: FOS, Glu, GF, W-PST, A-PST, S-PST

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	6	FOS, Glu, GF, W-PST, A-PST, S-PST

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	5	1.86446	0.372893	1069.85	0.000
Error	30	0.01046	0.000349		
Total	35	1.87492			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0186694	99.44%	99.35%	99.20%

### Means

Factor	N	Mean	StDev	95% CI
FOS	6	0.56230	0.00754	(0.54673, 0.57787)
Glu	6	0.67592	0.00435	(0.66035, 0.69148)
GF	6	0.12737	0.00532	(0.11180, 0.14293)
W-PST	6	0.39728	0.02011	(0.38172, 0.41285)
A-PST	6	0.6735	0.0326	(0.6579, 0.6891)
S-PST	6	0.14572	0.02287	(0.13015, 0.16128)

*Pooled StDev = 0.0186694*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
Glu	6	0.67592	A
A-PST	6	0.6735	A
FOS	6	0.56230	B
W-PST	6	0.39728	C
S-PST	6	0.14572	D
GF	6	0.12737	D

*Means that do not share a letter are significantly different.*

### 3.4. Chỉ số prebiotic các chiết xuất PS nấm *T. versicolor*

BIFIDO

#### One-way ANOVA: PI(FOS), PI(A-PST), PI(S-PST), PI(W-PST)

##### Method

Null hypothesis All means are equal  
Alternative hypothesis Not all means are equal  
Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

##### Factor Information

Factor Levels Values

Factor 4 PI(FOS), PI(A-PST), PI(S-PST), PI(W-PST)

##### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	2.40373	0.801244	373.31	0.000
Error	20	0.04293	0.002146		
Total	23	2.44666			

##### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0463283	98.25%	97.98%	97.47%

##### Means

Factor	N	Mean	StDev	95% CI
PI(FOS)	6	0.7600	0.0723	(0.7206, 0.7995)
PI(A-PST)	6	0.85120	0.02432	(0.81175, 0.89065)
PI(S-PST)	6	0.0685	0.0450	(0.0290, 0.1079)
PI(W-PST)	6	0.3463	0.0272	(0.3069, 0.3858)

*Pooled StDev = 0.0463283*

##### Tukey Pairwise Comparisons

##### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
PI(A-PST)	6	0.85120	A
PI(FOS)	6	0.7600	B
PI(W-PST)	6	0.3463	C
PI(S-PST)	6	0.0685	D

*Means that do not share a letter are significantly different.*

## One-way ANOVA: PI(FOS), PI(A-PST), PI(S-PST), PI(W-PST)

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

#### Factor Levels Values

Factor	Levels	Values
Factor	4	PI(FOS), PI(A-PST), PI(S-PST), PI(W-PST)

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	0.1274	0.042475	6.70	0.003
Error	20	0.1267	0.006337		
Total	23	0.2542			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0796070	50.13%	42.65%	28.19%

### Means

Factor	N	Mean	StDev	95% CI
PI(FOS)	6	0.2791	0.1360	(0.2113, 0.3469)
PI(A-PST)	6	0.3078	0.0616	(0.2400, 0.3756)
PI(S-PST)	6	0.3793	0.0414	(0.3115, 0.4471)
PI(W-PST)	6	0.4678	0.0365	(0.4000, 0.5356)

*Pooled StDev = 0.0796070*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
PI(W-PST)	6	0.4678	A
PI(S-PST)	6	0.3793	A B
PI(A-PST)	6	0.3078	B
PI(FOS)	6	0.2791	B

*Means that do not share a letter are significantly different.*

## One-way ANOVA: PI(FOS), PI(A-PST), PI(S-PST), PI(W-PST)

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	PI(FOS), PI(A-PST), PI(S-PST), PI(W-PST)

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	0.76088	0.253626	166.16	0.000
Error	20	0.03053	0.001526		
Total	23	0.79141			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0390692	96.14%	95.56%	94.45%

### Means

Factor	N	Mean	StDev	95% CI
PI(FOS)	6	0.7817	0.0488	(0.7484, 0.8150)
PI(A-PST)	6	0.6785	0.0496	(0.6453, 0.7118)
PI(S-PST)	6	0.50216	0.02329	(0.46889, 0.53543)
PI(W-PST)	6	0.3138	0.0269	(0.2806, 0.3471)

*Pooled StDev = 0.0390692*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
PI(FOS)	6	0.7817	A
PI(A-PST)	6	0.6785	B
PI(S-PST)	6	0.50216	C
PI(W-PST)	6	0.3138	D

*Means that do not share a letter are significantly different.*



## One-way ANOVA: PI(FOS), PI(A-PST), PI(S-PST), PI(W-PST)

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

#### Factor Levels Values

Factor	Levels	Values
Factor	4	PI(FOS), PI(A-PST), PI(S-PST), PI(W-PST)

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	0.67722	0.225740	210.44	0.000
Error	20	0.02145	0.001073		
Total	23	0.69867			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0327520	96.93%	96.47%	95.58%

### Means

Factor	N	Mean	StDev	95% CI
PI(FOS)	6	0.27699	0.02007	(0.24910, 0.30489)
PI(A-PST)	6	0.4699	0.0349	(0.4420, 0.4978)
PI(S-PST)	6	0.0708	0.0334	(0.0429, 0.0987)
PI(W-PST)	6	0.0622	0.0394	(0.0343, 0.0901)

*Pooled StDev = 0.0327520*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
PI(A-PST)	6	0.4699	A
PI(FOS)	6	0.27699	B
PI(S-PST)	6	0.0708	C
PI(W-PST)	6	0.0622	C

*Means that do not share a letter are significantly different.*

## One-way ANOVA: PI(FOS), PI(A-PST), PI(S-PST), PI(W-PST)

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

#### Factor Levels Values

Factor	Levels	Values
Factor	4	PI(FOS), PI(A-PST), PI(S-PST), PI(W-PST)

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	2.79554	0.931846	610.72	0.000
Error	20	0.03052	0.001526		
Total	23	2.82605			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0390616	98.92%	98.76%	98.45%

### Means

Factor	N	Mean	StDev	95% CI
PI(FOS)	6	0.57585	0.02270	(0.54258, 0.60911)
PI(A-PST)	6	0.9352	0.0404	(0.9019, 0.9684)
PI(S-PST)	6	0.0403	0.0412	(0.0070, 0.0735)
PI(W-PST)	6	0.2335	0.0475	(0.2003, 0.2668)

*Pooled StDev = 0.0390616*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
PI(A-PST)	6	0.9352	A
PI(FOS)	6	0.57585	B
PI(W-PST)	6	0.2335	C
PI(S-PST)	6	0.0403	D

*Means that do not share a letter are significantly different.*

### 3.5. Khảo sát khả năng kháng tiêu hoá các PS nấm

KHÁNG TIÊU

#### One-way ANOVA: % versus NT

##### Method

Null hypothesis All means are equal  
Alternative hypothesis Not all means are equal  
Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

##### Factor Information

###### Factor Levels Values

NT 7 A-PSC, A-PST, FOS, S-PSC, S-PST, W-PSC, W-PST

##### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
NT	6	311.38	51.8961	56.00	0.000
Error	14	12.98	0.9268		
Total	20	324.35			

##### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.962699	96.00%	94.29%	91.00%

##### Means

NT	N	Mean	StDev	95% CI
A-PSC	3	10.140	0.948	(8.948, 11.332)
A-PST	3	15.054	0.964	(13.862, 16.246)
FOS	3	8.751	0.336	(7.559, 9.943)
S-PSC	3	2.069	0.568	(0.877, 3.261)
S-PST	3	4.457	0.539	(3.265, 5.649)
W-PSC	3	6.955	1.081	(5.763, 8.147)
W-PST	3	8.288	1.662	(7.096, 9.480)

*Pooled StDev = 0.962699*

##### Tukey Pairwise Comparisons

###### Grouping Information Using the Tukey Method and 95% Confidence

NT	N	Mean	Grouping
A-PST	3	15.054	A
A-PSC	3	10.140	B
FOS	3	8.751	B C
W-PST	3	8.288	B C
W-PSC	3	6.955	C D
S-PST	3	4.457	D E
S-PSC	3	2.069	E

*Means that do not share a letter are significantly different.*

### 3.6. Khả năng chống lại vi khuẩn gây hại của môi trường nuôi cấy *L. plantarum* WCFS1 bổ sung PS chiết xuất từ nấm *C. militaris*

E. COLI ĐT 24H

#### One-way ANOVA: CT1, CT2, CT3, CT4, CT5

##### Method

Null hypothesis All means are equal  
Alternative hypothesis Not all means are equal  
Significance level  $\alpha = 0.05$

Equal variances were assumed for the analysis.

##### Factor Information

Factor	Levels	Values
Factor	5	CT1, CT2, CT3, CT4, CT5

##### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	4	43.761	10.9402	17.16	0.000
Error	10	6.376	0.6376		
Total	14	50.137			

##### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.798507	87.28%	82.20%	71.39%

##### Means

Factor	N	Mean	StDev	95% CI
CT1	3	27.060	1.211	(26.033, 28.087)
CT2	3	25.670	0.666	(24.643, 26.697)
CT3	3	26.997	0.384	(25.969, 28.024)
CT4	3	26.493	0.915	(25.466, 27.521)
CT5	3	22.470	0.541	(21.443, 23.497)

Pooled StDev = 0.798507

##### Tukey Pairwise Comparisons

##### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
CT1	3	27.060	A
CT3	3	26.997	A
CT4	3	26.493	A
CT2	3	25.670	A
CT5	3	22.470	B

Means that do not share a letter are significantly different.

## One-way ANOVA: CT1, CT2, CT3, CT4, CT5

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	5	CT1, CT2, CT3, CT4, CT5

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	4	15.113	3.7783	11.77	0.001
Error	10	3.211	0.3211		
Total	14	18.324			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.566639	82.48%	75.47%	60.58%

### Means

Factor	N	Mean	StDev	95% CI
CT1	3	27.680	0.619	(26.951, 28.409)
CT2	3	27.213	0.401	(26.484, 27.942)
CT3	3	27.113	0.391	(26.384, 27.842)
CT4	3	28.660	0.823	(27.931, 29.389)
CT5	3	25.563	0.481	(24.834, 26.292)

*Pooled StDev = 0.566639*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
CT4	3	28.660	A
CT1	3	27.680	A B
CT2	3	27.213	A B
CT3	3	27.113	B
CT5	3	25.563	C

*Means that do not share a letter are significantly different.*

## One-way ANOVA: CT1, CT2, CT3, CT4, CT5

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	5	CT1, CT2, CT3, CT4, CT5

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	4	30.701	7.6751	35.73	0.000
Error	10	2.148	0.2148		
Total	14	32.849			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.463487	93.46%	90.84%	85.29%

### Means

Factor	N	Mean	StDev	95% CI
CT1	3	26.927	0.499	(26.330, 27.523)
CT2	3	26.467	0.297	(25.870, 27.063)
CT3	3	24.883	0.403	(24.287, 25.480)
CT4	3	27.220	0.658	(26.624, 27.816)
CT5	3	23.420	0.375	(22.824, 24.016)

*Pooled StDev = 0.463487*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
CT4	3	27.220	A
CT1	3	26.927	A
CT2	3	26.467	A
CT3	3	24.883	B
CT5	3	23.420	C

*Means that do not share a letter are significantly different.*

## One-way ANOVA: CT1, CT2, CT3, CT4, CT5

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	5	CT1, CT2, CT3, CT4, CT5

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	4	25.492	6.3731	35.17	0.000
Error	10	1.812	0.1812		
Total	14	27.305			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.425707	93.36%	90.71%	85.07%

### Means

Factor	N	Mean	StDev	95% CI
CT1	3	25.010	0.353	(24.462, 25.558)
CT2	3	23.800	0.469	(23.252, 24.348)
CT3	3	24.630	0.420	(24.082, 25.178)
CT4	3	26.270	0.377	(25.722, 26.818)
CT5	3	22.347	0.492	(21.799, 22.894)

*Pooled StDev = 0.425707*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
CT4	3	26.270	A
CT1	3	25.010	B
CT3	3	24.630	B C
CT2	3	23.800	C
CT5	3	22.347	D

*Means that do not share a letter are significantly different.*

### 3.7. Khả năng chống lại vi khuẩn gây hại của môi trường nuôi cấy *L. plantarum* WCFS1 bổ sung PS chiết xuất từ nấm *T. versicolor*

E. COLI VC 24H

#### One-way ANOVA: CT1, CT2, CT3, CT4, CT5

##### Method

Null hypothesis All means are equal  
Alternative hypothesis Not all means are equal  
Significance level  $\alpha = 0.05$

Equal variances were assumed for the analysis.

##### Factor Information

Factor	Levels	Values
Factor	5	CT1, CT2, CT3, CT4, CT5

##### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	4	52.605	13.1513	35.27	0.000
Error	10	3.729	0.3729		
Total	14	56.334			

##### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.610677	93.38%	90.73%	85.11%

##### Means

Factor	N	Mean	StDev	95% CI
CT1	3	28.280	0.298	(27.494, 29.066)
CT2	3	28.473	0.853	(27.688, 29.259)
CT3	3	28.477	0.623	(27.691, 29.262)
CT4	3	28.857	0.344	(28.071, 29.642)
CT5	3	23.863	0.736	(23.078, 24.649)

Pooled StDev = 0.610677

##### Tukey Pairwise Comparisons

##### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
CT4	3	28.857	A
CT3	3	28.477	A
CT2	3	28.473	A
CT1	3	28.280	A
CT5	3	23.863	B

Means that do not share a letter are significantly different.



## One-way ANOVA: CT1, CT2, CT3, CT4, CT5

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	5	CT1, CT2, CT3, CT4, CT5

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	4	26.532	6.6330	18.59	0.000
Error	10	3.568	0.3568		
Total	14	30.100			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.597344	88.15%	83.40%	73.33%

### Means

Factor	N	Mean	StDev	95% CI
CT1	3	27.880	0.760	(27.112, 28.648)
CT2	3	26.907	0.387	(26.138, 27.675)
CT3	3	27.743	0.294	(26.975, 28.512)
CT4	3	27.653	0.924	(26.885, 28.422)
CT5	3	24.330	0.341	(23.562, 25.098)

*Pooled StDev = 0.597344*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
CT1	3	27.880	A
CT3	3	27.743	A
CT4	3	27.653	A
CT2	3	26.907	A
CT5	3	24.330	B

*Means that do not share a letter are significantly different.*

## One-way ANOVA: CT1, CT2, CT3, CT4, CT5

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	5	CT1, CT2, CT3, CT4, CT5

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	4	42.126	10.5315	30.28	0.000
Error	10	3.478	0.3478		
Total	14	45.604			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.589723	92.37%	89.32%	82.84%

### Means

Factor	N	Mean	StDev	95% CI
CT1	3	28.473	0.809	(27.715, 29.232)
CT2	3	27.350	0.676	(26.591, 28.109)
CT3	3	26.600	0.560	(25.841, 27.359)
CT4	3	27.530	0.248	(26.771, 28.289)
CT5	3	23.573	0.503	(22.815, 24.332)

*Pooled StDev = 0.589723*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
CT1	3	28.473	A
CT4	3	27.530	A B
CT2	3	27.350	A B
CT3	3	26.600	B
CT5	3	23.573	C

*Means that do not share a letter are significantly different.*

## One-way ANOVA: CT1, CT2, CT3, CT4, CT5

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	5	CT1, CT2, CT3, CT4, CT5

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	4	28.5463	7.13658	72.10	0.000
Error	10	0.9898	0.09898		
Total	14	29.5361			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.314611	96.65%	95.31%	92.46%

### Means

Factor	N	Mean	StDev	95% CI
CT1	3	27.037	0.250	(26.632, 27.441)
CT2	3	26.050	0.352	(25.645, 26.455)
CT3	3	27.493	0.496	(27.089, 27.898)
CT4	3	28.1900	0.1539	(27.7853, 28.5947)
CT5	3	24.213	0.199	(23.809, 24.618)

*Pooled StDev = 0.314611*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
CT4	3	28.1900	A
CT3	3	27.493	A B
CT1	3	27.037	B
CT2	3	26.050	C
CT5	3	24.213	D

*Means that do not share a letter are significantly different.*

### 3.8. Hàm lượng SCFA tạo ra khi nuôi probiotic trong môi trường bổ sung PS chiết xuất sợi nấm *T. versicolor*

L. CASEIN VC BUTYRIC ACID

#### One-way ANOVA: W-PST, S-PST, A-PST, FOS

##### Method

Null hypothesis All means are equal  
Alternative hypothesis Not all means are equal  
Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

##### Factor Information

Factor	Levels	Values
Factor	4	W-PST, S-PST, A-PST, FOS

##### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	9112582	3037527	1630.05	0.000
Error	8	14908	1863		
Total	11	9127489			

##### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
43.1677	99.84%	99.78%	99.63%

##### Means

Factor	N	Mean	StDev	95% CI
W-PST	3	4772.9	67.9	(4715.4, 4830.4)
S-PST	3	4516.8	18.3	(4459.3, 4574.3)
A-PST	3	6684.4	33.4	(6626.9, 6741.8)
FOS	3	4768.9	37.4	(4711.4, 4826.4)

*Pooled StDev = 43.1677*

##### Tukey Pairwise Comparisons

##### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
A-PST	3	6684.4	A
W-PST	3	4772.9	B
FOS	3	4768.9	B
S-PST	3	4516.8	C

*Means that do not share a letter are significantly different.*

## One-way ANOVA: W-PST, S-PST, A-PST, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	W-PST, S-PST, A-PST, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	12188510	4062837	3302.06	0.000
Error	8	9843	1230		
Total	11	12198353			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
35.0770	99.92%	99.89%	99.82%

### Means

Factor	N	Mean	StDev	95% CI
W-PST	3	6394.3	39.3	(6347.6, 6441.0)
S-PST	3	4272.7	33.8	(4226.0, 4319.4)
A-PST	3	6771.9	37.8	(6725.2, 6818.6)
FOS	3	6572.8	28.5	(6526.1, 6619.5)

*Pooled StDev = 35.0770*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
A-PST	3	6771.9	A
FOS	3	6572.8	B
W-PST	3	6394.3	C
S-PST	3	4272.7	D

*Means that do not share a letter are significantly different.*

## One-way ANOVA: W-PST, S-PST, A-PST, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	W-PST, S-PST, A-PST, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	24510040	8170013	10820.83	0.000
Error	8	6040	755		
Total	11	24516080			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
27.4777	99.98%	99.97%	99.94%

### Means

Factor	N	Mean	StDev	95% CI
W-PST	3	3197.14	16.72	(3160.56, 3233.73)
S-PST	3	3623.7	32.5	(3587.1, 3660.3)
A-PST	3	6838.2	33.7	(6801.6, 6874.8)
FOS	3	3980.4	23.5	(3943.8, 4017.0)

*Pooled StDev = 27.4777*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
A-PST	3	6838.2	A
FOS	3	3980.4	B
S-PST	3	3623.7	C
W-PST	3	3197.14	D

*Means that do not share a letter are significantly different.*

## One-way ANOVA: W-PST, S-PST, A-PST, FOS

## Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

## Factor Information

Factor	Levels	Values
Factor	4	W-PST, S-PST, A-PST, FOS

## Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	11285193	3761731	3411.90	0.000
Error	8	8820	1103		
Total	11	11294013			

## Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
33.2044	99.92%	99.89%	99.82%

## Means

Factor	N	Mean	StDev	95% CI
W-PST	3	6748.0	44.9	(6703.8, 6792.3)
S-PST	3	4587.4	20.8	(4543.2, 4631.6)
A-PST	3	4766.3	31.4	(4722.1, 4810.5)
FOS	3	4280.4	31.3	(4236.2, 4324.6)

*Pooled StDev = 33.2044*

## Tukey Pairwise Comparisons

## Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
W-PST	3	6748.0	A
A-PST	3	4766.3	B
S-PST	3	4587.4	C
FOS	3	4280.4	D

*Means that do not share a letter are significantly different.*

## One-way ANOVA: W-PST, S-PST, A-PST, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	W-PST, S-PST, A-PST, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	2649110	883037	363.28	0.000
Error	8	19446	2431		
Total	11	2668555			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
49.3024	99.27%	99.00%	98.36%

### Means

Factor	N	Mean	StDev	95% CI
W-PST	3	3656.2	34.0	(3590.6, 3721.8)
S-PST	3	4173.4	37.1	(4107.8, 4239.1)
A-PST	3	4771.9	62.3	(4706.3, 4837.5)
FOS	3	4788.8	57.5	(4723.2, 4854.4)

*Pooled StDev = 49.3024*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
FOS	3	4788.8	A
A-PST	3	4771.9	A
S-PST	3	4173.4	B
W-PST	3	3656.2	C

*Means that do not share a letter are significantly different.*



## One-way ANOVA: W-PST, S-PST, A-PST, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	W-PST, S-PST, A-PST, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	6237	2078.9	15.83	0.001
Error	8	1051	131.4		
Total	11	7288			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
11.4615	85.58%	80.17%	67.55%

### Means

Factor	N	Mean	StDev	95% CI
W-PST	3	159.77	6.83	(144.51, 175.03)
S-PST	3	167.06	8.34	(151.80, 182.32)
A-PST	3	156.58	7.44	(141.32, 171.84)
FOS	3	213.0	18.8	(197.8, 228.3)

*Pooled StDev = 11.4615*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
FOS	3	213.0	A
S-PST	3	167.06	B
W-PST	3	159.77	B
A-PST	3	156.58	B

*Means that do not share a letter are significantly different.*

## One-way ANOVA: W-PST, S-PST, A-PST, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	W-PST, S-PST, A-PST, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	106458	35486.0	570.61	0.000
Error	8	498	62.2		
Total	11	106956			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
7.88605	99.53%	99.36%	98.95%

### Means

Factor	N	Mean	StDev	95% CI
W-PST	3	367.11	9.43	(356.61, 377.61)
S-PST	3	149.37	7.61	(138.87, 159.87)
A-PST	3	151.88	3.38	(141.38, 162.38)
FOS	3	147.60	9.52	(137.10, 158.10)

*Pooled StDev = 7.88605*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
W-PST	3	367.11	A
A-PST	3	151.88	B
S-PST	3	149.37	B
FOS	3	147.60	B

*Means that do not share a letter are significantly different.*

## One-way ANOVA: W-PST, S-PST, A-PST, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	W-PST, S-PST, A-PST, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	62808.9	20936.3	562.61	0.000
Error	8	297.7	37.2		
Total	11	63106.6			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
6.10023	99.53%	99.35%	98.94%

### Means

Factor	N	Mean	StDev	95% CI
W-PST	3	159.85	4.30	(151.73, 167.97)
S-PST	3	169.33	6.14	(161.21, 177.46)
A-PST	3	325.32	6.46	(317.20, 333.45)
FOS	3	148.23	7.15	(140.11, 156.36)

*Pooled StDev = 6.10023*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
A-PST	3	325.32	A
S-PST	3	169.33	B
W-PST	3	159.85	B C
FOS	3	148.23	C

*Means that do not share a letter are significantly different.*

## One-way ANOVA: W-PST, S-PST, A-PST, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	W-PST, S-PST, A-PST, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	68380.8	22793.6	749.41	0.000
Error	8	243.3	30.4		
Total	11	68624.1			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
5.51501	99.65%	99.51%	99.20%

### Means

Factor	N	Mean	StDev	95% CI
W-PST	3	328.84	4.95	(321.50, 336.19)
S-PST	3	140.72	3.01	(133.38, 148.07)
A-PST	3	246.96	2.77	(239.62, 254.30)
FOS	3	320.49	8.97	(313.15, 327.84)

*Pooled StDev = 5.51501*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
W-PST	3	328.84	A
FOS	3	320.49	A
A-PST	3	246.96	B
S-PST	3	140.72	C

*Means that do not share a letter are significantly different.*

## One-way ANOVA: W-PST, S-PST, A-PST, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	W-PST, S-PST, A-PST, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	54524.8	18174.9	239.80	0.000
Error	8	606.3	75.8		
Total	11	55131.2			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
8.70582	98.90%	98.49%	97.53%

### Means

Factor	N	Mean	StDev	95% CI
W-PST	3	161.03	15.64	(149.44, 172.62)
S-PST	3	161.04	6.11	(149.45, 172.63)
A-PST	3	313.01	3.05	(301.42, 324.60)
FOS	3	150.84	3.43	(139.25, 162.43)

*Pooled StDev = 8.70582*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
A-PST	3	313.01	A
S-PST	3	161.04	B
W-PST	3	161.03	B
FOS	3	150.84	B

*Means that do not share a letter are significantly different.*

## One-way ANOVA: W-PST, S-PST, A-PST, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	W-PST, S-PST, A-PST, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	881410	293803	245.77	0.000
Error	8	9563	1195		
Total	11	890973			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
34.5749	98.93%	98.52%	97.58%

### Means

Factor	N	Mean	StDev	95% CI
W-PST	3	5539.9	33.1	(5493.8, 5585.9)
S-PST	3	6074.7	32.0	(6028.6, 6120.7)
A-PST	3	6237.3	39.5	(6191.3, 6283.4)
FOS	3	6142.1	33.2	(6096.0, 6188.1)

*Pooled StDev = 34.5749*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
A-PST	3	6237.3	A
FOS	3	6142.1	B
S-PST	3	6074.7	B
W-PST	3	5539.9	C

*Means that do not share a letter are significantly different.*

## One-way ANOVA: W-PST, S-PST, A-PST, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	W-PST, S-PST, A-PST, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	5367497	1789166	808.43	0.000
Error	8	17705	2213		
Total	11	5385202			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
47.0441	99.67%	99.55%	99.26%

### Means

Factor	N	Mean	StDev	95% CI
W-PST	3	7219.0	58.4	(7156.3, 7281.6)
S-PST	3	6345.6	39.6	(6283.0, 6408.3)
A-PST	3	5337.2	37.2	(5274.6, 5399.9)
FOS	3	6445.3	49.9	(6382.7, 6507.9)

*Pooled StDev = 47.0441*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
W-PST	3	7219.0	A
FOS	3	6445.3	B
S-PST	3	6345.6	B
A-PST	3	5337.2	C

*Means that do not share a letter are significantly different.*

## One-way ANOVA: W-PST, S-PST, A-PST, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	W-PST, S-PST, A-PST, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	2654441	884814	330.69	0.000
Error	8	21405	2676		
Total	11	2675846			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
51.7270	99.20%	98.90%	98.20%

### Means

Factor	N	Mean	StDev	95% CI
W-PST	3	5029.5	51.4	(4960.7, 5098.4)
S-PST	3	6247.4	70.4	(6178.5, 6316.3)
A-PST	3	6047.9	48.3	(5979.0, 6116.8)
FOS	3	5570.0	27.9	(5501.2, 5638.9)

*Pooled StDev = 51.7270*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
S-PST	3	6247.4	A
A-PST	3	6047.9	B
FOS	3	5570.0	C
W-PST	3	5029.5	D

*Means that do not share a letter are significantly different.*



## One-way ANOVA: W-PST, S-PST, A-PST, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	W-PST, S-PST, A-PST, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	68037	22679	6.18	0.018
Error	8	29362	3670		
Total	11	97399			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
60.5830	69.85%	58.55%	32.17%

### Means

Factor	N	Mean	StDev	95% CI
W-PST	3	6245.5	49.5	(6164.9, 6326.2)
S-PST	3	6401.3	42.6	(6320.7, 6482.0)
A-PST	3	6220.4	91.2	(6139.7, 6301.0)
FOS	3	6221.1	45.7	(6140.5, 6301.8)

*Pooled StDev = 60.5830*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
S-PST	3	6401.3	A
W-PST	3	6245.5	A B
FOS	3	6221.1	B
A-PST	3	6220.4	B

*Means that do not share a letter are significantly different.*

## One-way ANOVA: W-PST, S-PST, A-PST, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	W-PST, S-PST, A-PST, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	1660469	553490	325.87	0.000
Error	8	13588	1699		
Total	11	1674057			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
41.2129	99.19%	98.88%	98.17%

### Means

Factor	N	Mean	StDev	95% CI
W-PST	3	6860.8	25.4	(6805.9, 6915.7)
S-PST	3	6031.6	37.6	(5976.7, 6086.4)
A-PST	3	6283.0	43.1	(6228.1, 6337.9)
FOS	3	5886.0	53.6	(5831.1, 5940.8)

*Pooled StDev = 41.2129*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
W-PST	3	6860.8	A
A-PST	3	6283.0	B
S-PST	3	6031.6	C
FOS	3	5886.0	D

*Means that do not share a letter are significantly different.*

### 3.9. Hàm lượng SCFA tạo ra khi nuôi probiotic trong môi trường bổ sung PS chiết xuất sợi nấm *C. militaris*

L. PENTOSUS - ĐT - BUTYRIC ACID

#### One-way ANOVA: W-PSC, S-PSC, A-PSC, FOS

##### Method

Null hypothesis All means are equal  
Alternative hypothesis Not all means are equal  
Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

##### Factor Information

Factor	Levels	Values
Factor	4	W-PSC, S-PSC, A-PSC, FOS

##### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	9052780	3017593	1030.27	0.000
Error	8	23432	2929		
Total	11	9076212			

##### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
54.1198	99.74%	99.65%	99.42%

##### Means

Factor	N	Mean	StDev	95% CI
W-PSC	3	6462.8	64.0	(6390.8, 6534.9)
S-PSC	3	4180.8	52.0	(4108.7, 4252.8)
A-PSC	3	4597.3	40.2	(4525.2, 4669.3)
FOS	3	4788.8	57.5	(4716.8, 4860.9)

*Pooled StDev = 54.1198*

##### Tukey Pairwise Comparisons

##### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
W-PSC	3	6462.8	A
FOS	3	4788.8	B
A-PSC	3	4597.3	C
S-PSC	3	4180.8	D

*Means that do not share a letter are significantly different.*

## One-way ANOVA: W-PSC, S-PSC, A-PSC, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	W-PSC, S-PSC, A-PSC, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	18984713	6328238	2743.58	0.000
Error	8	18452	2307		
Total	11	19003165			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
48.0267	99.90%	99.87%	99.78%

### Means

Factor	N	Mean	StDev	95% CI
W-PSC	3	6506.9	69.7	(6443.0, 6570.9)
S-PSC	3	3867.6	34.9	(3803.6, 3931.5)
A-PSC	3	6635.0	46.6	(6571.0, 6698.9)
FOS	3	4280.4	31.3	(4216.5, 4344.4)

*Pooled StDev = 48.0267*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
A-PSC	3	6635.0	A
W-PSC	3	6506.9	B
FOS	3	4280.4	C
S-PSC	3	3867.6	D

*Means that do not share a letter are significantly different.*

## One-way ANOVA: W-PSC, S-PSC, A-PSC, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	W-PSC, S-PSC, A-PSC, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	12515305	4171768	1962.79	0.000
Error	8	17003	2125		
Total	11	12532309			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
46.1024	99.86%	99.81%	99.69%

### Means

Factor	N	Mean	StDev	95% CI
W-PSC	3	6360.5	63.2	(6299.1, 6421.9)
S-PSC	3	3836.5	35.9	(3775.1, 3897.9)
A-PSC	3	4274.1	51.7	(4212.7, 4335.4)
FOS	3	3980.4	23.5	(3919.0, 4041.8)

*Pooled StDev = 46.1024*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
W-PSC	3	6360.5	A
A-PSC	3	4274.1	B
FOS	3	3980.4	C
S-PSC	3	3836.5	D

*Means that do not share a letter are significantly different.*

## One-way ANOVA: W-PSC, S-PSC, A-PSC, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	W-PSC, S-PSC, A-PSC, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	18305518	6101839	1883.99	0.000
Error	8	25910	3239		
Total	11	18331428			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
56.9104	99.86%	99.81%	99.68%

### Means

Factor	N	Mean	StDev	95% CI
W-PSC	3	3612.7	58.4	(3536.9, 3688.5)
S-PSC	3	3704.2	65.4	(3628.4, 3780.0)
A-PSC	3	3867.9	66.8	(3792.1, 3943.7)
FOS	3	6572.8	28.5	(6497.0, 6648.5)

*Pooled StDev = 56.9104*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
FOS	3	6572.8	A
A-PSC	3	3867.9	B
S-PSC	3	3704.2	C
W-PSC	3	3612.7	C

*Means that do not share a letter are significantly different.*

## One-way ANOVA: W-PSC, S-PSC, A-PSC, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	W-PSC, S-PSC, A-PSC, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	17949801	5983267	2332.29	0.000
Error	8	20523	2565		
Total	11	17970324			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
50.6498	99.89%	99.84%	99.74%

### Means

Factor	N	Mean	StDev	95% CI
W-PSC	3	6603.7	29.3	(6536.3, 6671.1)
S-PSC	3	3148.0	51.2	(3080.5, 3215.4)
A-PSC	3	4762.0	73.4	(4694.5, 4829.4)
FOS	3	4768.9	37.4	(4701.5, 4836.3)

*Pooled StDev = 50.6498*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
W-PSC	3	6603.7	A
FOS	3	4768.9	B
A-PSC	3	4762.0	B
S-PSC	3	3148.0	C

*Means that do not share a letter are significantly different.*

## One-way ANOVA: W-PSC, S-PSC, A-PSC, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	W-PSC, S-PSC, A-PSC, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	57703.3	19234.4	179.89	0.000
Error	8	855.4	106.9		
Total	11	58558.7			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
10.3404	98.54%	97.99%	96.71%

### Means

Factor	N	Mean	StDev	95% CI
W-PSC	3	326.01	4.10	(312.24, 339.78)
S-PSC	3	166.17	6.63	(152.41, 179.94)
A-PSC	3	147.65	3.60	(133.88, 161.42)
FOS	3	213.0	18.8	(199.3, 226.8)

*Pooled StDev = 10.3404*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
W-PSC	3	326.01	A
FOS	3	213.0	B
S-PSC	3	166.17	C
A-PSC	3	147.65	C

*Means that do not share a letter are significantly different.*



## One-way ANOVA: W-PSC, S-PSC, A-PSC, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	W-PSC, S-PSC, A-PSC, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	44235.7	14745.2	473.22	0.000
Error	8	249.3	31.2		
Total	11	44484.9			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
5.58208	99.44%	99.23%	98.74%

### Means

Factor	N	Mean	StDev	95% CI
W-PSC	3	247.46	4.53	(240.03, 254.89)
S-PSC	3	138.31	2.08	(130.88, 145.74)
A-PSC	3	277.26	3.03	(269.83, 284.70)
FOS	3	147.60	9.52	(140.17, 155.03)

*Pooled StDev = 5.58208*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
A-PSC	3	277.26	A
W-PSC	3	247.46	B
FOS	3	147.60	C
S-PSC	3	138.31	C

*Means that do not share a letter are significantly different.*

## One-way ANOVA: W-PSC, S-PSC, A-PSC, FOS

## Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

## Factor Information

Factor	Levels	Values
Factor	4	W-PSC, S-PSC, A-PSC, FOS

## Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	67502.9	22501.0	524.34	0.000
Error	8	343.3	42.9		
Total	11	67846.2			

## Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
6.55078	99.49%	99.30%	98.86%

## Means

Factor	N	Mean	StDev	95% CI
W-PSC	3	328.97	5.74	(320.25, 337.69)
S-PSC	3	164.78	8.39	(156.06, 173.50)
A-PSC	3	155.87	4.14	(147.15, 164.59)
FOS	3	148.23	7.15	(139.51, 156.95)

*Pooled StDev = 6.55078*

## Tukey Pairwise Comparisons

## Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
W-PSC	3	328.97	A
S-PSC	3	164.78	B
A-PSC	3	155.87	B
FOS	3	148.23	B

*Means that do not share a letter are significantly different.*

## One-way ANOVA: W-PSC, S-PSC, A-PSC, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	W-PSC, S-PSC, A-PSC, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	57405.1	19135.0	489.07	0.000
Error	8	313.0	39.1		
Total	11	57718.1			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
6.25499	99.46%	99.25%	98.78%

### Means

Factor	N	Mean	StDev	95% CI
W-PSC	3	167.27	3.13	(158.94, 175.59)
S-PSC	3	161.52	6.02	(153.19, 169.85)
A-PSC	3	154.53	5.48	(146.20, 162.85)
FOS	3	320.49	8.97	(312.17, 328.82)

*Pooled StDev = 6.25499*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
FOS	3	320.49	A
W-PSC	3	167.27	B
S-PSC	3	161.52	B
A-PSC	3	154.53	B

*Means that do not share a letter are significantly different.*

**One-way ANOVA: W-PSC, S-PSC, A-PSC, FOS****Method**

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

**Factor Information**

Factor	Levels	Values
Factor	4	W-PSC, S-PSC, A-PSC, FOS

**Analysis of Variance**

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	56126.4	18708.8	557.30	0.000
Error	8	268.6	33.6		
Total	11	56395.0			

**Model Summary**

S	R-sq	R-sq(adj)	R-sq(pred)
5.79402	99.52%	99.35%	98.93%

**Means**

Factor	N	Mean	StDev	95% CI
W-PSC	3	311.42	6.30	(303.70, 319.13)
S-PSC	3	159.57	8.58	(151.86, 167.29)
A-PSC	3	150.67	3.02	(142.96, 158.39)
FOS	3	150.84	3.43	(143.13, 158.55)

*Pooled StDev = 5.79402*

**Tukey Pairwise Comparisons****Grouping Information Using the Tukey Method and 95% Confidence**

Factor	N	Mean	Grouping
W-PSC	3	311.42	A
S-PSC	3	159.57	B
FOS	3	150.84	B
A-PSC	3	150.67	B

*Means that do not share a letter are significantly different.*

## One-way ANOVA: W-PSC, S-PSC, A-PSC, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	W-PSC, S-PSC, A-PSC, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	337694	112565	92.84	0.000
Error	8	9700	1212		
Total	11	347394			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
34.8205	97.21%	96.16%	93.72%

### Means

Factor	N	Mean	StDev	95% CI
W-PSC	3	5649.4	22.9	(5603.0, 5695.8)
S-PSC	3	6053.7	26.8	(6007.4, 6100.1)
A-PSC	3	6063.2	27.1	(6016.8, 6109.5)
FOS	3	5886.0	53.6	(5839.6, 5932.3)

*Pooled StDev = 34.8205*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
A-PSC	3	6063.2	A
S-PSC	3	6053.7	A
FOS	3	5886.0	B
W-PSC	3	5649.4	C

*Means that do not share a letter are significantly different.*

**One-way ANOVA: W-PSC, S-PSC, A-PSC, FOS****Method**

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

**Factor Information**

Factor	Levels	Values
Factor	4	W-PSC, S-PSC, A-PSC, FOS

**Analysis of Variance**

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	1175805	391935	376.25	0.000
Error	8	8333	1042		
Total	11	1184138			

**Model Summary**

S	R-sq	R-sq(adj)	R-sq(pred)
32.2752	99.30%	99.03%	98.42%

**Means**

Factor	N	Mean	StDev	95% CI
W-PSC	3	5532.9	22.8	(5489.9, 5575.9)
S-PSC	3	6320.2	19.1	(6277.2, 6363.2)
A-PSC	3	5737.5	46.7	(5694.6, 5780.5)
FOS	3	6142.1	33.2	(6099.1, 6185.0)

*Pooled StDev = 32.2752*

**Tukey Pairwise Comparisons****Grouping Information Using the Tukey Method and 95% Confidence**

Factor	N	Mean	Grouping
S-PSC	3	6320.2	A
FOS	3	6142.1	B
A-PSC	3	5737.5	C
W-PSC	3	5532.9	D

*Means that do not share a letter are significantly different.*

## One-way ANOVA: W-PSC, S-PSC, A-PSC, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	W-PSC, S-PSC, A-PSC, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	5861837	1953946	1770.00	0.000
Error	8	8831	1104		
Total	11	5870669			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
33.2254	99.85%	99.79%	99.66%

### Means

Factor	N	Mean	StDev	95% CI
W-PSC	3	5044.3	29.3	(5000.1, 5088.6)
S-PSC	3	6575.8	24.0	(6531.5, 6620.0)
A-PSC	3	6848.3	22.3	(6804.0, 6892.5)
FOS	3	6445.3	49.9	(6401.1, 6489.5)

*Pooled StDev = 33.2254*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
A-PSC	3	6848.3	A
S-PSC	3	6575.8	B
FOS	3	6445.3	C
W-PSC	3	5044.3	D

*Means that do not share a letter are significantly different.*

## One-way ANOVA: W-PSC, S-PSC, A-PSC, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	4	W-PSC, S-PSC, A-PSC, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	3011694	1003898	2290.03	0.000
Error	8	3507	438		
Total	11	3015201			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
20.9375	99.88%	99.84%	99.74%

### Means

Factor	N	Mean	StDev	95% CI
W-PSC	3	6373.1	23.7	(6345.3, 6401.0)
S-PSC	3	6853.71	10.41	(6825.83, 6881.59)
A-PSC	3	6731.3	17.5	(6703.5, 6759.2)
FOS	3	5570.0	27.9	(5542.2, 5597.9)

*Pooled StDev = 20.9375*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
S-PSC	3	6853.71	A
A-PSC	3	6731.3	B
W-PSC	3	6373.1	C
FOS	3	5570.0	D

*Means that do not share a letter are significantly different.*



## One-way ANOVA: W-PSC, S-PSC, A-PSC, FOS

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

#### Factor Levels Values

Factor 4 W-PSC, S-PSC, A-PSC, FOS

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	3493707	1164569	866.61	0.000
Error	8	10751	1344		
Total	11	3504457			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
36.6581	99.69%	99.58%	99.31%

### Means

Factor	N	Mean	StDev	95% CI
W-PSC	3	5759.3	24.0	(5710.5, 5808.1)
S-PSC	3	7237.2	35.8	(7188.4, 7286.1)
A-PSC	3	6237.8	37.7	(6189.0, 6286.6)
FOS	3	6221.1	45.7	(6172.3, 6269.9)

*Pooled StDev = 36.6581*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

##### Factor N Mean Grouping

S-PSC	3	7237.2	A
A-PSC	3	6237.8	B
FOS	3	6221.1	B
W-PSC	3	5759.3	C

*Means that do not share a letter are significantly different.*

## PHỤ LỤC 4. XỬ LÝ SỐ LIỆU ỨNG DỤNG SỢI NẤM CHẾ BIẾN NƯỚC NẤM BÀO NGƯ' LÊN MEN LACTIC

### 4.1. Sự thay đổi tổng hàm lượng các chất hòa tan Brix

WORKSHEET 1

#### General Linear Model: bx versus Nồng độ, Thời gian

##### Method

Factor coding (-1, 0, +1)

##### Factor Information

Factor	Type	Levels	Values
Nồng độ	Fixed	6	0.0, 0.2, 0.4, 0.6, 0.8, 1.0
Thời gian	Fixed	4	0h, 12h, 24h, 48h

##### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Nồng độ	5	0.8658	0.173167	23.46	0.000
Thời gian	3	0.3679	0.122639	16.62	0.000
Error	63	0.4650	0.007381		
Lack-of-Fit	15	0.3150	0.021000	6.72	0.000
Pure Error	48	0.1500	0.003125		
Total	71	1.6988			

##### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0859125	72.63%	69.15%	64.25%

##### Coefficients

Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	5.9375	0.0101	586.43	0.000	
Nồng độ					
0.0	-0.1958	0.0226	-8.65	0.000	1.67
0.2	-0.0542	0.0226	-2.39	0.020	1.67
0.4	-0.0333	0.0226	-1.47	0.146	1.67
0.6	0.0500	0.0226	2.21	0.031	1.67
0.8	0.1125	0.0226	4.97	0.000	1.67
Thời gian					
0h	0.1181	0.0175	6.73	0.000	1.50
12h	-0.0153	0.0175	-0.87	0.387	1.50
24h	-0.0292	0.0175	-1.66	0.101	1.50

##### Regression Equation

bx = 5.9375 - 0.1958 Nồng độ\_0.0 - 0.0542 Nồng độ\_0.2 - 0.0333 Nồng độ\_0.4  
+ 0.0500 Nồng độ\_0.6 + 0.1125 Nồng độ\_0.8 + 0.1208 Nồng độ\_1.0 + 0.1181 Thời gian\_0h  
- 0.0153 Thời gian\_12h - 0.0292 Thời gian\_24h - 0.0736 Thời gian\_48h

##### Fits and Diagnostics for Unusual Observations

Obs	bx	Fit	Resid	Std Resid
54	5.8500	6.0292	-0.1792	-2.23 R
55	5.5000	5.6681	-0.1681	-2.09 R
59	6.0000	5.8097	0.1903	2.37 R

R Large residual

## One-way ANOVA: CT1, CT2, CT3, CT4, CT5, CT6

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	6	CT1, CT2, CT3, CT4, CT5, CT6

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	5	0.42944	0.085889	103.07	0.000
Error	12	0.01000	0.000833		
Total	17	0.43944			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0288675	97.72%	96.78%	94.88%

### Means

Factor	N	Mean	StDev	95% CI
CT1	3	5.8667	0.0577	(5.8304, 5.9030)
CT2	3	5.8833	0.0289	(5.8470, 5.9196)
CT3	3	6.000	0.000	(5.964, 6.036)
CT4	3	6.100	0.000	(6.064, 6.136)
CT5	3	6.200	0.000	(6.164, 6.236)
CT6	3	6.2833	0.0289	(6.2470, 6.3196)

*Pooled StDev = 0.0288675*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
CT6	3	6.2833	A
CT5	3	6.200	B
CT4	3	6.100	C
CT3	3	6.000	D
CT2	3	5.8833	E
CT1	3	5.8667	E

*Means that do not share a letter are significantly different.*

## One-way ANOVA: CT1, CT2, CT3, CT4, CT5, CT6

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	6	CT1, CT2, CT3, CT4, CT5, CT6

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	5	0.48444	0.096889	31.71	0.000
Error	12	0.03667	0.003056		
Total	17	0.52111			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0552771	92.96%	90.03%	84.17%

### Means

Factor	N	Mean	StDev	95% CI
CT1	3	5.6667	0.1155	(5.5971, 5.7362)
CT2	3	5.7667	0.0289	(5.6971, 5.8362)
CT3	3	5.900	0.000	(5.830, 5.970)
CT4	3	6.000	0.000	(5.930, 6.070)
CT5	3	6.0667	0.0577	(5.9971, 6.1362)
CT6	3	6.1333	0.0289	(6.0638, 6.2029)

*Pooled StDev = 0.0552771*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
CT6	3	6.1333	A
CT5	3	6.0667	A
CT4	3	6.000	A B
CT3	3	5.900	B C
CT2	3	5.7667	C D
CT1	3	5.6667	D

*Means that do not share a letter are significantly different.*

## One-way ANOVA: CT1, CT2, CT3, CT4, CT5, CT6

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	6	CT1, CT2, CT3, CT4, CT5, CT6

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	5	0.11125	0.022250	17.80	0.000
Error	12	0.01500	0.001250		
Total	17	0.12625			

### Model Summary

	S	R-sq	R-sq(adj)	R-sq(pred)
	0.0353553	88.12%	83.17%	73.27%

### Means

Factor	N	Mean	StDev	95% CI
CT1	3	5.7500	0.0500	(5.7055, 5.7945)
CT2	3	5.9667	0.0289	(5.9222, 6.0111)
CT3	3	5.9167	0.0289	(5.8722, 5.9611)
CT4	3	5.9167	0.0289	(5.8722, 5.9611)
CT5	3	6.000	0.000	(5.956, 6.044)
CT6	3	5.9000	0.0500	(5.8555, 5.9445)

*Pooled StDev = 0.0353553*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
CT5	3	6.000	A
CT2	3	5.9667	A B
CT4	3	5.9167	A B
CT3	3	5.9167	A B
CT6	3	5.9000	B
CT1	3	5.7500	C

*Means that do not share a letter are significantly different.*

## One-way ANOVA: CT1, CT2, CT3, CT4, CT5, CT6

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	6	CT1, CT2, CT3, CT4, CT5, CT6

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	5	0.15569	0.031139	4.23	0.019
Error	12	0.08833	0.007361		
Total	17	0.24403			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0857969	63.80%	48.72%	18.55%

### Means

Factor	N	Mean	StDev	95% CI
CT1	3	5.6833	0.1607	(5.5754, 5.7913)
CT2	3	5.9167	0.0764	(5.8087, 6.0246)
CT3	3	5.800	0.000	(5.692, 5.908)
CT4	3	5.9333	0.0577	(5.8254, 6.0413)
CT5	3	5.9333	0.0577	(5.8254, 6.0413)
CT6	3	5.9167	0.0764	(5.8087, 6.0246)

*Pooled StDev = 0.0857969*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
CT5	3	5.9333	A
CT4	3	5.9333	A
CT6	3	5.9167	A B
CT2	3	5.9167	A B
CT3	3	5.800	A B
CT1	3	5.6833	B

*Means that do not share a letter are significantly different.*

## 4.2. Sự thay đổi tổng hàm lượng pH

WORKSHEET 6

### General Linear Model: PH versus Nồng độ, Thời gian

#### Method

Factor coding (-1, 0, +1)

#### Factor Information

Factor	Type	Levels	Values
Nồng độ	Fixed	7	0.4, CT1, CT2, CT3, CT4, CT5, CT6
Thời gian	Fixed	4	0h, 12h, 24h, 48h

#### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Nồng độ	6	0.4889	0.0815	4.26	0.001
Thời gian	3	41.3940	13.7980	720.64	0.000
Error	62	1.1871	0.0191		
Lack-of-Fit	14	1.1727	0.0838	279.48	0.000
Pure Error	48	0.0144	0.0003		
Total	71	51.4180			

#### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.138372	97.69%	97.36%	96.94%

#### Coefficients

Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	3.6624	0.0186	197.13	0.000	
Nồng độ					
0.4	0.0110	0.0754	0.15	0.884	4.12
CT1	0.1563	0.0385	4.06	0.000	1.86
CT2	0.0459	0.0385	1.19	0.238	1.86
CT3	-0.0150	0.0451	-0.33	0.740	2.22
CT4	-0.0592	0.0385	-1.54	0.130	1.86
CT5	-0.0488	0.0385	-1.27	0.210	1.86
Thời gian					
0h	1.4252	0.0309	46.06	0.000	1.80
12h	-0.3160	0.0286	-11.06	0.000	1.53
24h	-0.5061	0.0286	-17.72	0.000	1.53

#### Regression Equation

PH = 3.6624 + 0.0110 Nồng độ\_0.4 + 0.1563 Nồng độ\_CT1 + 0.0459 Nồng độ\_CT2  
 - 0.0150 Nồng độ\_CT3 - 0.0592 Nồng độ\_CT4 - 0.0488 Nồng độ\_CT5 - 0.0903 Nồng độ\_CT6  
 + 1.4252 Thời gian\_0h - 0.3160 Thời gian\_12h - 0.5061 Thời gian\_24h  
 - 0.6032 Thời gian\_48h

#### Fits and Diagnostics for Unusual Observations

Obs	PH	Fit	Resid	Std Resid
1	5.7160	5.2440	0.4720	3.66 R
2	5.6000	5.2440	0.3560	2.76 R
3	5.5910	5.2440	0.3470	2.69 R
16	4.7300	4.9974	-0.2674	-2.08 R
17	4.7200	4.9974	-0.2774	-2.15 R
18	4.7120	4.9974	-0.2854	-2.22 R

R Large residual

## One-way ANOVA: CT1, CT2, CT3, CT4, CT5, CT6

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

#### Factor Levels Values

Factor 6 CT1, CT2, CT3, CT4, CT5, CT6

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	5	1.64389	0.328778	290.28	0.000
Error	12	0.01359	0.001133		
Total	17	1.65748			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0336543	99.18%	98.84%	98.16%

### Means

Factor	N	Mean	StDev	95% CI
CT1	3	5.6357	0.0697	(5.5933, 5.6780)
CT2	3	5.2900	0.0372	(5.2477, 5.3323)
CT3	3	5.09867	0.00208	(5.05633, 5.14100)
CT4	3	4.8973	0.0203	(4.8550, 4.9397)
CT5	3	4.89867	0.00723	(4.85633, 4.94100)
CT6	3	4.72067	0.00902	(4.67833, 4.76300)

*Pooled StDev = 0.0336543*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
CT1	3	5.6357	A
CT2	3	5.2900	B
CT3	3	5.09867	C
CT5	3	4.89867	D
CT4	3	4.8973	D
CT6	3	4.72067	E

*Means that do not share a letter are significantly different.*



## One-way ANOVA: CT1, CT2, CT3, CT4, CT5, CT6

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	6	CT1, CT2, CT3, CT4, CT5, CT6

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	5	0.010967	0.002193	56.32	0.000
Error	12	0.000467	0.000039		
Total	17	0.011434			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0062405	95.91%	94.21%	90.80%

### Means

Factor	N	Mean	StDev	95% CI
CT1	3	3.39733	0.01380	(3.38948, 3.40518)
CT2	3	3.34533	0.00473	(3.33748, 3.35318)
CT3	3	3.33667	0.00153	(3.32882, 3.34452)
CT4	3	3.32067	0.00208	(3.31282, 3.32852)
CT5	3	3.33200	0.00200	(3.32415, 3.33985)
CT6	3	3.33567	0.00321	(3.32782, 3.34352)

*Pooled StDev = 0.00624055*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
CT1	3	3.39733	A
CT2	3	3.34533	B
CT3	3	3.33667	B C
CT6	3	3.33567	B C
CT5	3	3.33200	B C
CT4	3	3.32067	C

*Means that do not share a letter are significantly different.*

## One-way ANOVA: CT1, CT2, CT3, CT4, CT5, CT6

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	6	CT1, CT2, CT3, CT4, CT5, CT6

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	5	0.004389	0.000878	46.75	0.000
Error	12	0.000225	0.000019		
Total	17	0.004615			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0043333	95.12%	93.08%	89.01%

### Means

Factor	N	Mean	StDev	95% CI
CT1	3	3.18500	0.00300	(3.17955, 3.19045)
CT2	3	3.15300	0.00624	(3.14755, 3.15845)
CT3	3	3.13700	0.00300	(3.13155, 3.14245)
CT4	3	3.14033	0.00503	(3.13488, 3.14578)
CT5	3	3.15267	0.00306	(3.14722, 3.15812)
CT6	3	3.15900	0.00458	(3.15355, 3.16445)

*Pooled StDev = 0.00433333*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
CT1	3	3.18500	A
CT6	3	3.15900	B
CT2	3	3.15300	B
CT5	3	3.15267	B
CT4	3	3.14033	C
CT3	3	3.13700	C

*Means that do not share a letter are significantly different.*

## One-way ANOVA: CT1, CT2, CT3, CT4, CT5, CT6

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	6	CT1, CT2, CT3, CT4, CT5, CT6

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	5	0.002422	0.000484	56.61	0.000
Error	12	0.000103	0.000009		
Total	17	0.002524			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0029250	95.93%	94.24%	90.85%

### Means

Factor	N	Mean	StDev	95% CI
CT1	3	3.05700	0.00173	(3.05332, 3.06068)
CT2	3	3.04500	0.00100	(3.04132, 3.04868)
CT3	3	3.04333	0.00493	(3.03965, 3.04701)
CT4	3	3.05467	0.00351	(3.05099, 3.05835)
CT5	3	3.07133	0.00252	(3.06765, 3.07501)
CT6	3	3.07333	0.00208	(3.06965, 3.07701)

*Pooled StDev = 0.00292499*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
CT6	3	3.07333	A
CT5	3	3.07133	A
CT1	3	3.05700	B
CT4	3	3.05467	B
CT2	3	3.04500	C
CT3	3	3.04333	C

*Means that do not share a letter are significantly different.*

### 4.3. Sự thay đổi tổng hàm lượng TAN

WORKSHEET 11

#### General Linear Model: TAN versus Nồng độ, Thời gian

##### Method

Factor coding (-1, 0, +1)

##### Factor Information

Factor	Type	Levels	Values
Nồng độ	Fixed	6	CT1, CT2, CT3, CT4, CT5, CT6
Thời gian	Fixed	4	0h, 12h, 24h, 48h

##### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Nồng độ	5	33.324	6.665	57.32	0.000
Thời gian	3	625.925	208.642	1794.58	0.000
Error	63	7.325	0.116		
Lack-of-Fit	15	7.028	0.469	75.97	0.000
Pure Error	48	0.296	0.006		
Total	71	666.573			

##### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.340972	98.90%	98.76%	98.56%

##### Coefficients

Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	6.0507	0.0402	150.57	0.000	
Nồng độ					
CT1	-1.1176	0.0899	-12.44	0.000	1.67
CT2	-0.5288	0.0899	-5.89	0.000	1.67
CT3	-0.0732	0.0899	-0.81	0.418	1.67
CT4	0.2249	0.0899	2.50	0.015	1.67
CT5	0.5531	0.0899	6.16	0.000	1.67
Thời gian					
0h	-4.3804	0.0696	-62.94	0.000	1.50
12h	-0.7507	0.0696	-10.79	0.000	1.50
24h	1.6018	0.0696	23.01	0.000	1.50

##### Regression Equation

TAN = 6.0507 - 1.1176 Nồng độ\_CT1 - 0.5288 Nồng độ\_CT2 - 0.0732 Nồng độ\_CT3  
+ 0.2249 Nồng độ\_CT4 + 0.5531 Nồng độ\_CT5 + 0.9416 Nồng độ\_CT6 - 4.3804 Thời gian\_0h  
- 0.7507 Thời gian\_12h + 1.6018 Thời gian\_24h + 3.5293 Thời gian\_48h

##### Fits and Diagnostics for Unusual Observations

Obs	TAN	Fit	Resid	Std Resid
1	1.327	0.553	0.775	2.43 R
2	1.350	0.553	0.797	2.50 R
3	1.440	0.553	0.887	2.78 R

R Large residual

## One-way ANOVA: CT1, CT2, CT3, CT4, CT5, CT6

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	6	CT1, CT2, CT3, CT4, CT5, CT6

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	5	0.97144	0.194289	120.69	0.000
Error	12	0.01932	0.001610		
Total	17	0.99076			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0401232	98.05%	97.24%	95.61%

### Means

Factor	N	Mean	StDev	95% CI
CT1	3	1.3725	0.0595	(1.3220, 1.4230)
CT2	3	1.4325	0.0344	(1.3820, 1.4830)
CT3	3	1.5900	0.0260	(1.5395, 1.6405)
CT4	3	1.7325	0.0225	(1.6820, 1.7830)
CT5	3	1.8600	0.0520	(1.8095, 1.9105)
CT6	3	2.0340	0.0324	(1.9835, 2.0845)

*Pooled StDev = 0.0401232*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
CT6	3	2.0340	A
CT5	3	1.8600	B
CT4	3	1.7325	C
CT3	3	1.5900	D
CT2	3	1.4325	E
CT1	3	1.3725	E

*Means that do not share a letter are significantly different.*

## One-way ANOVA: CT1, CT2, CT3, CT4, CT5, CT6

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	6	CT1, CT2, CT3, CT4, CT5, CT6

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	5	18.5674	3.71349	354.93	0.000
Error	12	0.1256	0.01046		
Total	17	18.6930			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.102286	99.33%	99.05%	98.49%

### Means

Factor	N	Mean	StDev	95% CI
CT1	3	3.6900	0.0900	(3.5613, 3.8187)
CT2	3	4.2600	0.0687	(4.1313, 4.3887)
CT3	3	5.4150	0.1132	(5.2863, 5.5437)
CT4	3	5.7900	0.1447	(5.6613, 5.9187)
CT5	3	6.0300	0.0450	(5.9013, 6.1587)
CT6	3	6.6150	0.1191	(6.4863, 6.7437)

*Pooled StDev = 0.102286*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
CT6	3	6.6150	A
CT5	3	6.0300	B
CT4	3	5.7900	B
CT3	3	5.4150	C
CT2	3	4.2600	D
CT1	3	3.6900	E

*Means that do not share a letter are significantly different.*

## One-way ANOVA: CT1, CT2, CT3, CT4, CT5, CT6

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	6	CT1, CT2, CT3, CT4, CT5, CT6

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	5	7.69151	1.53830	262.96	0.000
Error	12	0.07020	0.00585		
Total	17	7.76171			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0764853	99.10%	98.72%	97.97%

### Means

Factor	N	Mean	StDev	95% CI
CT1	3	6.6300	0.1132	(6.5338, 6.7262)
CT2	3	7.2000	0.0900	(7.1038, 7.2962)
CT3	3	7.4550	0.0520	(7.3588, 7.5512)
CT4	3	7.8150	0.0687	(7.7188, 7.9112)
CT5	3	8.1750	0.0687	(8.0788, 8.2712)
CT6	3	8.6400	0.0450	(8.5438, 8.7362)

*Pooled StDev = 0.0764853*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
CT6	3	8.6400	A
CT5	3	8.1750	B
CT4	3	7.8150	C
CT3	3	7.4550	D
CT2	3	7.2000	E
CT1	3	6.6300	F

*Means that do not share a letter are significantly different.*

## One-way ANOVA: CT1, CT2, CT3, CT4, CT5, CT6

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
Factor	6	CT1, CT2, CT3, CT4, CT5, CT6

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	5	13.1215	2.62431	388.79	0.000
Error	12	0.0810	0.00675		
Total	17	13.2025			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0821584	99.39%	99.13%	98.62%

### Means

Factor	N	Mean	StDev	95% CI
CT1	3	8.0400	0.0687	(7.9366, 8.1434)
CT2	3	9.1950	0.1375	(9.0916, 9.2984)
CT3	3	9.4500	0.0779	(9.3466, 9.5534)
CT4	3	9.7650	0.0450	(9.6616, 9.8684)
CT5	3	10.3500	0.0900	(10.2466, 10.4534)
CT6	3	10.6800	0.0260	(10.5766, 10.7834)

*Pooled StDev = 0.0821584*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
CT6	3	10.6800	A
CT5	3	10.3500	B
CT4	3	9.7650	C
CT3	3	9.4500	D
CT2	3	9.1950	E
CT1	3	8.0400	F

*Means that do not share a letter are significantly different.*



## 4.4. Khả năng kháng oxi hoá của nước nấm Bào ngư lên men

ABTS O GIỜ

### One-way ANOVA: % versus NT

#### Method

Null hypothesis All means are equal  
Alternative hypothesis Not all means are equal  
Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

#### Factor Information

Factor	Levels	Values
NT	6	CT1, CT2, CT3, CT4, CT5, CT6

#### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
NT	5	2373.79	474.757	592.66	0.000
Error	12	9.61	0.801		
Total	17	2383.40			

#### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.895021	99.60%	99.43%	99.09%

#### Means

NT	N	Mean	StDev	95% CI
CT1	3	25.840	0.435	(24.714, 26.966)
CT2	3	35.053	1.206	(33.927, 36.179)
CT3	3	40.173	0.845	(39.047, 41.299)
CT4	3	46.680	0.716	(45.554, 47.806)
CT5	3	54.539	1.309	(53.413, 55.665)
CT6	3	59.785	0.472	(58.659, 60.911)

*Pooled StDev = 0.895021*

#### Tukey Pairwise Comparisons

##### Grouping Information Using the Tukey Method and 95% Confidence

NT	N	Mean	Grouping
CT6	3	59.785	A
CT5	3	54.539	B
CT4	3	46.680	C
CT3	3	40.173	D
CT2	3	35.053	E
CT1	3	25.840	F

*Means that do not share a letter are significantly different.*

## One-way ANOVA: % versus NT

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
NT	6	CT1, CT2, CT3, CT4, CT5, CT6

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
NT	5	2255.14	451.028	290.08	0.000
Error	12	18.66	1.555		
Total	17	2273.80			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
1.24693	99.18%	98.84%	98.15%

### Means

NT	N	Mean	StDev	95% CI
CT1	3	25.917	0.349	(24.348, 27.486)
CT2	3	34.720	0.867	(33.152, 36.289)
CT3	3	39.686	1.057	(38.117, 41.254)
CT4	3	48.501	1.074	(46.932, 50.069)
CT5	3	54.530	1.182	(52.961, 56.098)
CT6	3	57.79	2.19	(56.22, 59.36)

*Pooled StDev = 1.24693*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

NT	N	Mean	Grouping
CT6	3	57.79	A
CT5	3	54.530	A
CT4	3	48.501	B
CT3	3	39.686	C
CT2	3	34.720	D
CT1	3	25.917	E

*Means that do not share a letter are significantly different.*

## One-way ANOVA: % versus NT

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
NT	6	CT1, CT2, CT3, CT4, CT5, CT6

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
NT	5	1226.34	245.268	513.42	0.000
Error	12	5.73	0.478		
Total	17	1232.07			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.691167	99.53%	99.34%	98.95%

### Means

NT	N	Mean	StDev	95% CI
CT1	3	25.845	0.466	(24.975, 26.714)
CT2	3	33.363	0.629	(32.494, 34.232)
CT3	3	37.872	0.394	(37.003, 38.741)
CT4	3	44.208	1.036	(43.339, 45.077)
CT5	3	47.158	0.637	(46.289, 48.027)
CT6	3	49.568	0.787	(48.698, 50.437)

*Pooled StDev = 0.691167*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

NT	N	Mean	Grouping
CT6	3	49.568	A
CT5	3	47.158	B
CT4	3	44.208	C
CT3	3	37.872	D
CT2	3	33.363	E
CT1	3	25.845	F

*Means that do not share a letter are significantly different.*

## One-way ANOVA: % versus NT

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
NT	6	CT1, CT2, CT3, CT4, CT5, CT6

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
NT	5	1171.37	234.274	1059.59	0.000
Error	12	2.65	0.221		
Total	17	1174.02			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.470212	99.77%	99.68%	99.49%

### Means

NT	N	Mean	StDev	95% CI
CT1	3	25.510	0.563	(24.919, 26.102)
CT2	3	32.564	0.595	(31.972, 33.155)
CT3	3	37.547	0.393	(36.956, 38.139)
CT4	3	43.248	0.482	(42.656, 43.839)
CT5	3	46.717	0.445	(46.126, 47.309)
CT6	3	48.345	0.267	(47.754, 48.937)

*Pooled StDev = 0.470212*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

NT	N	Mean	Grouping
CT6	3	48.345	A
CT5	3	46.717	B
CT4	3	43.248	C
CT3	3	37.547	D
CT2	3	32.564	E
CT1	3	25.510	F

*Means that do not share a letter are significantly different.*

## 4.5. Khả năng kích thích sự tăng trưởng đối với lợi khuẩn

TĂNG TRƯỞNG 0 GIỜ

### One-way ANOVA: 0h versus CT

#### Method

Null hypothesis All means are equal  
Alternative hypothesis Not all means are equal  
Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

#### Factor Information

Factor	Levels	Values
CT	6	CT1, CT2, CT3, CT4, CT5, CT6

#### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
CT	5	0.002848	0.000570	0.47	0.790
Error	18	0.021601	0.001200		
Total	23	0.024450			

#### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.0346420	11.65%	0.00%	0.00%

#### Means

CT	N	Mean	StDev	95% CI
CT1	4	8.3723	0.0387	(8.3359, 8.4087)
CT2	4	8.3961	0.0459	(8.3597, 8.4325)
CT3	4	8.38982	0.01314	(8.35343, 8.42621)
CT4	4	8.3894	0.0263	(8.3530, 8.4258)
CT5	4	8.3647	0.0220	(8.3283, 8.4011)
CT6	4	8.3799	0.0475	(8.3435, 8.4163)

*Pooled StDev = 0.0346420*

#### Tukey Pairwise Comparisons

##### Grouping Information Using the Tukey Method and 95% Confidence

CT	N	Mean	Grouping
CT2	4	8.3961	A
CT3	4	8.38982	A
CT4	4	8.3894	A
CT6	4	8.3799	A
CT1	4	8.3723	A
CT5	4	8.3647	A

*Means that do not share a letter are significantly different.*

## One-way ANOVA: 12h versus CT

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
CT	6	CT1, CT2, CT3, CT4, CT5, CT6

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
CT	5	0.9049	0.18098	8.55	0.000
Error	18	0.3809	0.02116		
Total	23	1.2858			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.145463	70.38%	62.15%	47.34%

### Means

CT	N	Mean	StDev	95% CI
CT1	4	10.9016	0.0416	(10.7488, 11.0544)
CT2	4	11.2039	0.1371	(11.0511, 11.3567)
CT3	4	11.2114	0.1457	(11.0586, 11.3642)
CT4	4	11.4877	0.1355	(11.3349, 11.6405)
CT5	4	11.4429	0.1534	(11.2901, 11.5957)
CT6	4	11.344	0.208	(11.192, 11.497)

*Pooled StDev = 0.145463*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

CT	N	Mean	Grouping
CT4	4	11.4877	A
CT5	4	11.4429	A
CT6	4	11.344	A
CT3	4	11.2114	B
CT2	4	11.2039	B
CT1	4	10.9016	B

*Means that do not share a letter are significantly different.*

## One-way ANOVA: 24h versus CT

## Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

## Factor Information

Factor	Levels	Values
CT	6	CT1, CT2, CT3, CT4, CT5, CT6

## Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
CT	5	0.8761	0.17521	8.98	0.000
Error	18	0.3510	0.01950		
Total	23	1.2271			

## Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.139647	71.39%	63.45%	49.14%

## Means

CT	N	Mean	StDev	95% CI
CT1	4	11.0054	0.1180	(10.8588, 11.1521)
CT2	4	11.3951	0.1621	(11.2484, 11.5418)
CT3	4	11.5141	0.1322	(11.3674, 11.6608)
CT4	4	11.5250	0.1315	(11.3784, 11.6717)
CT5	4	11.5342	0.1537	(11.3875, 11.6809)
CT6	4	11.5367	0.1357	(11.3900, 11.6834)

*Pooled StDev = 0.139647*

## Tukey Pairwise Comparisons

## Grouping Information Using the Tukey Method and 95% Confidence

CT	N	Mean	Grouping
CT6	4	11.5367	A
CT5	4	11.5342	A
CT4	4	11.5250	A
CT3	4	11.5141	A
CT2	4	11.3951	A
CT1	4	11.0054	B

*Means that do not share a letter are significantly different.*

## One-way ANOVA: 48h versus CT

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
CT	6	CT1, CT2, CT3, CT4, CT5, CT6

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
CT	5	0.7452	0.14904	6.23	0.002
Error	18	0.4305	0.02391		
Total	23	1.1757			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.154644	63.38%	53.21%	34.91%

### Means

CT	N	Mean	StDev	95% CI
CT1	4	10.9818	0.1067	(10.8194, 11.1443)
CT2	4	11.2175	0.1910	(11.0550, 11.3799)
CT3	4	11.4839	0.1603	(11.3214, 11.6463)
CT4	4	11.4638	0.1483	(11.3014, 11.6263)
CT5	4	11.3905	0.1668	(11.2280, 11.5529)
CT6	4	11.4153	0.1418	(11.2529, 11.5778)

*Pooled StDev = 0.154644*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

CT	N	Mean	Grouping
CT3	4	11.4839	A
CT4	4	11.4638	A
CT6	4	11.4153	A
CT5	4	11.3905	A
CT2	4	11.2175	B
CT1	4	10.9818	B

*Means that do not share a letter are significantly different.*



## 4.6. Khả năng ức chế hại khuẩn

### 4.6.1. Ức chế *S. aureus*

KHÁNG KHUẨN *S. AUREUS* 12 GIỜ

#### One-way ANOVA: 12h versus C1

##### Method

Null hypothesis All means are equal  
Alternative hypothesis Not all means are equal  
Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

##### Factor Information

Factor	Levels	Values
C1	6	CT1, CT2, CT3, CT4, CT5, CT6

##### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
C1	5	5.983	1.19662	13.77	0.000
Error	12	1.043	0.08691		
Total	17	7.026			

##### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.294807	85.16%	78.97%	66.60%

##### Means

C1	N	Mean	StDev	95% CI
CT1	3	7.597	0.295	(7.226, 7.968)
CT2	3	8.2500	0.1229	(7.8792, 8.6208)
CT3	3	7.7433	0.1234	(7.3725, 8.1142)
CT4	3	7.937	0.389	(7.566, 8.308)
CT5	3	8.503	0.455	(8.132, 8.874)
CT6	3	9.323	0.214	(8.952, 9.694)

*Pooled StDev = 0.294807*

##### Tukey Pairwise Comparisons

##### Grouping Information Using the Tukey Method and 95% Confidence

C1	N	Mean	Grouping
CT6	3	9.323	A
CT5	3	8.503	B
CT2	3	8.2500	B C
CT4	3	7.937	B C
CT3	3	7.7433	B C
CT1	3	7.597	C

*Means that do not share a letter are significantly different.*

## One-way ANOVA: 24h versus C1

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
C1	6	CT1, CT2, CT3, CT4, CT5, CT6

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
C1	5	68.919	13.7839	135.28	0.000
Error	12	1.223	0.1019		
Total	17	70.142			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.319209	98.26%	97.53%	96.08%

### Means

C1	N	Mean	StDev	95% CI
CT1	3	11.677	0.403	(11.275, 12.078)
CT2	3	11.8100	0.1513	(11.4085, 12.2115)
CT3	3	13.587	0.242	(13.185, 13.988)
CT4	3	15.283	0.311	(14.882, 15.685)
CT5	3	16.1833	0.1206	(15.7818, 16.5849)
CT6	3	16.527	0.506	(16.125, 16.928)

*Pooled StDev = 0.319209*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

C1	N	Mean	Grouping
CT6	3	16.527	A
CT5	3	16.1833	A
CT4	3	15.283	B
CT3	3	13.587	C
CT2	3	11.8100	D
CT1	3	11.677	D

*Means that do not share a letter are significantly different.*

## One-way ANOVA: 48h versus C1

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
C1	6	CT1, CT2, CT3, CT4, CT5, CT6

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
C1	5	26.0010	5.20020	85.36	0.000
Error	12	0.7311	0.06092		
Total	17	26.7320			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.246824	97.27%	96.13%	93.85%

### Means

C1	N	Mean	StDev	95% CI
CT1	3	9.993	0.263	(9.683, 10.304)
CT2	3	11.1233	0.1002	(10.8128, 11.4338)
CT3	3	11.2600	0.1652	(10.9495, 11.5705)
CT4	3	12.3767	0.1041	(12.0662, 12.6872)
CT5	3	12.660	0.245	(12.350, 12.970)
CT6	3	13.697	0.434	(13.386, 14.007)

*Pooled StDev = 0.246824*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

C1	N	Mean	Grouping
CT6	3	13.697	A
CT5	3	12.660	B
CT4	3	12.3767	B
CT3	3	11.2600	C
CT2	3	11.1233	C
CT1	3	9.993	D

*Means that do not share a letter are significantly different.*

#### 4.6.2. Ước chế *E. coli*

KHÁNG KHUẨN *E. COLI* 12 GIỜ

##### One-way ANOVA: 12 giờ versus NT

###### Method

Null hypothesis All means are equal  
Alternative hypothesis Not all means are equal  
Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

###### Factor Information

Factor	Levels	Values
NT	6	CT1, CT2, CT3, CT4, CT5, CT6

###### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
NT	5	56.099	11.2197	72.66	0.000
Error	12	1.853	0.1544		
Total	17	57.952			

###### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.392952	96.80%	95.47%	92.81%

###### Means

NT	N	Mean	StDev	95% CI
CT1	3	6.5467	0.1457	(6.0524, 7.0410)
CT2	3	8.023	0.446	(7.529, 8.518)
CT3	3	7.803	0.378	(7.309, 8.298)
CT4	3	8.0933	0.1007	(7.5990, 8.5876)
CT5	3	10.040	0.715	(9.546, 10.534)
CT6	3	11.963	0.206	(11.469, 12.458)

*Pooled StDev = 0.392952*

###### Tukey Pairwise Comparisons

###### Grouping Information Using the Tukey Method and 95% Confidence

NT	N	Mean	Grouping
CT6	3	11.963	A
CT5	3	10.040	B
CT4	3	8.0933	C
CT2	3	8.023	C
CT3	3	7.803	C
CT1	3	6.5467	D

*Means that do not share a letter are significantly different.*

## One-way ANOVA: 24 giờ versus NT

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
NT	6	CT1, CT2, CT3, CT4, CT5, CT6

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
NT	5	11.282	2.2563	17.67	0.000
Error	12	1.533	0.1277		
Total	17	12.814			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.357367	88.04%	83.06%	73.09%

### Means

NT	N	Mean	StDev	95% CI
CT1	3	8.880	0.724	(8.430, 9.330)
CT2	3	9.047	0.241	(8.597, 9.496)
CT3	3	10.630	0.352	(10.180, 11.080)
CT4	3	9.4000	0.1500	(8.9505, 9.8495)
CT5	3	10.3700	0.1709	(9.9205, 10.8195)
CT6	3	10.8967	0.0924	(10.4471, 11.3462)

*Pooled StDev = 0.357367*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

NT	N	Mean	Grouping
CT6	3	10.8967	A
CT3	3	10.630	A
CT5	3	10.3700	A B
CT4	3	9.4000	B C
CT2	3	9.047	C
CT1	3	8.880	C

*Means that do not share a letter are significantly different.*

## One-way ANOVA: 48 giờ versus NT

### Method

Null hypothesis All means are equal  
 Alternative hypothesis Not all means are equal  
 Significance level  $\alpha = 0.05$

*Equal variances were assumed for the analysis.*

### Factor Information

Factor	Levels	Values
NT	6	CT1, CT2, CT3, CT4, CT5, CT6

### Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
NT	5	83.139	16.6277	91.17	0.000
Error	12	2.188	0.1824		
Total	17	85.327			

### Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.427051	97.44%	96.37%	94.23%

### Means

NT	N	Mean	StDev	95% CI
CT1	3	6.887	0.640	(6.349, 7.424)
CT2	3	9.327	0.202	(8.789, 9.864)
CT3	3	10.9100	0.1473	(10.3728, 11.4472)
CT4	3	12.353	0.445	(11.816, 12.891)
CT5	3	11.743	0.296	(11.206, 12.281)
CT6	3	13.430	0.580	(12.893, 13.967)

*Pooled StDev = 0.427051*

### Tukey Pairwise Comparisons

#### Grouping Information Using the Tukey Method and 95% Confidence

NT	N	Mean	Grouping
CT6	3	13.430	A
CT4	3	12.353	A B
CT5	3	11.743	B C
CT3	3	10.9100	C
CT2	3	9.327	D
CT1	3	6.887	E

*Means that do not share a letter are significantly different.*

#### 4.7. Số liệu điểm đánh giá cảm quan

**Bảng 4.1. Màu sắc nước lên men**

appearance	CT1-24h	CT2-24h	CT3-24h	CT4-24h	CT5-24h	CT6-24h
1	2.44	3.68	4.47	7.24	6.27	4.09
2	2.25	4.55	3.30	7.28	5.68	5.40
3	2.41	4.53	4.86	6.26	6.35	4.06
4	2.48	3.89	4.62	6.62	5.24	4.25
5	2.14	4.09	5.05	6.73	6.13	4.54
6	2.23	2.05	2.48	6.64	4.32	4.28
7	2.85	2.66	4.55	7.13	7.00	4.95
8	2.38	3.55	4.51	6.50	5.49	4.80
9	2.71	3.98	3.15	6.47	5.99	4.15
10	2.19	3.98	3.85	7.28	5.60	4.36
11	2.92	4.38	3.73	6.78	5.57	4.44
12	1.80	3.75	4.73	7.22	5.55	4.64
13	2.09	1.68	3.80	6.87	6.31	4.12
14	2.17	2.81	4.33	6.63	5.73	4.22
15	2.37	4.13	4.62	6.66	5.99	4.19
16	2.21	4.92	4.24	8.05	6.08	4.12
17	1.98	4.12	4.20	7.34	5.54	4.53
18	2.95	3.11	5.05	6.66	5.18	4.79
19	2.18	3.75	4.28	6.59	5.75	4.63
20	2.16	3.31	3.92	6.76	5.69	5.00
21	1.86	4.09	4.54	6.81	4.90	3.98
22	2.45	2.81	2.99	6.92	7.12	4.22
23	2.11	4.46	2.38	6.56	5.99	4.61
24	2.53	3.12	3.47	8.07	5.79	4.35
25	2.31	3.38	3.81	7.02	4.87	4.55
26	2.13	4.26	4.43	6.61	6.03	4.20
27	2.26	4.85	3.58	6.79	5.23	4.41
28	2.64	3.60	4.53	7.79	5.91	4.48
29	2.57	3.79	4.97	8.00	5.61	4.35
30	2.01	3.24	3.22	7.00	5.76	4.76
31	2.37	3.82	2.62	6.76	6.27	4.26
32	2.19	3.82	4.07	6.20	5.29	4.88
33	2.36	3.02	4.42	6.36	6.32	4.52
34	2.66	4.02	3.72	6.80	6.57	4.65
35	2.40	3.81	3.22	7.61	6.63	3.81
36	2.59	4.83	4.61	6.78	5.72	4.69
37	2.35	3.84	3.70	6.91	4.91	4.08

<b>38</b>	2.34	4.35	5.51	7.03	5.31	4.61
<b>39</b>	2.55	3.02	3.79	6.84	6.02	5.10
<b>40</b>	2.47	2.21	5.51	6.83	6.72	4.37
<b>41</b>	2.28	2.80	3.71	6.98	6.45	5.14
<b>42</b>	2.42	3.49	4.21	6.21	6.06	5.04
<b>43</b>	2.27	3.09	5.01	6.19	6.65	4.54
<b>44</b>	2.36	3.84	4.14	7.02	5.49	4.85
<b>45</b>	2.36	1.93	3.88	6.19	5.29	4.51
<b>46</b>	2.35	3.61	4.13	6.25	5.69	4.74
<b>47</b>	2.19	3.62	5.76	7.08	5.90	4.88
<b>48</b>	2.32	3.18	5.47	6.49	6.43	4.31
<b>49</b>	2.51	3.42	4.91	7.38	5.69	4.86
<b>50</b>	2.95	4.06	4.93	6.37	6.36	4.64
<b>51</b>	2.48	3.85	3.42	6.44	5.14	4.52
<b>52</b>	2.60	4.26	4.15	7.52	5.07	4.86
<b>53</b>	2.18	1.59	4.42	6.88	5.63	4.87
<b>54</b>	1.96	4.36	3.21	6.28	4.97	5.05
<b>55</b>	2.49	2.51	3.42	6.37	5.93	5.36
<b>56</b>	2.59	2.27	3.91	7.56	5.08	4.57
<b>57</b>	2.21	3.39	3.19	7.02	5.94	4.72
<b>58</b>	1.83	1.94	3.87	6.58	5.57	4.27
<b>59</b>	2.29	4.64	2.96	7.10	5.92	4.24
<b>60</b>	2.32	4.93	4.45	6.69	6.23	4.64
<b>61</b>	2.66	3.04	4.24	6.97	4.97	5.15
<b>62</b>	2.39	2.94	4.40	6.46	6.50	4.50
<b>63</b>	3.08	3.06	4.59	4.99	5.32	4.45
<b>64</b>	1.99	3.68	3.95	6.70	6.28	4.31
<b>65</b>	2.62	3.51	3.66	7.40	6.46	4.99
<b>66</b>	2.29	2.78	3.82	6.61	5.90	4.70
<b>67</b>	2.61	2.60	4.27	6.71	5.41	4.24
<b>68</b>	2.84	3.73	4.88	5.96	5.42	4.64
<b>69</b>	2.20	3.06	5.99	7.05	6.22	5.01
<b>70</b>	2.07	4.08	4.63	7.42	5.66	4.29
<b>71</b>	2.22	3.46	5.03	6.56	5.15	4.58
<b>72</b>	2.37	2.94	5.17	6.91	6.19	4.83
<b>73</b>	2.41	2.91	4.35	6.42	5.87	4.84
<b>74</b>	2.50	3.13	4.34	7.67	6.06	3.98
<b>75</b>	2.58	2.96	4.56	6.83	5.33	4.34
<b>76</b>	2.86	2.64	3.67	8.02	5.70	4.83
<b>77</b>	2.01	3.59	5.26	6.27	5.94	4.43
<b>78</b>	2.48	3.82	3.93	7.15	5.47	4.40
<b>79</b>	2.05	4.11	4.62	7.38	6.18	4.28
<b>80</b>	2.47	2.75	5.00	7.40	5.61	4.91



<b>81</b>	2.37	3.01	4.07	6.97	6.59	4.69
<b>82</b>	2.36	2.26	5.75	7.62	6.57	4.27
mean	2.37	3.46	4.22	6.87	5.81	4.56
sd	0.26	0.77	0.75	0.52	0.54	0.33

**Bảng 4.2. Mùi hương nước lên men**

aroma	CT1-24h	CT2-24h	CT3-24h	CT4-24h	CT5-24h	CT6-24h
<b>1</b>	2.70	3.77	4.79	6.21	4.85	5.09
<b>2</b>	3.24	3.79	4.89	6.25	5.47	5.03
<b>3</b>	3.55	3.59	4.38	5.44	4.98	4.41
<b>4</b>	2.60	3.80	4.87	5.57	5.12	5.91
<b>5</b>	2.64	3.49	5.02	5.53	4.91	5.90
<b>6</b>	2.76	3.31	4.79	5.20	5.44	6.06
<b>7</b>	3.56	3.65	4.82	5.88	4.93	5.21
<b>8</b>	2.83	3.84	4.36	6.08	4.64	5.07
<b>9</b>	2.93	3.78	4.47	5.55	4.66	4.91
<b>10</b>	3.54	3.84	4.83	5.04	4.39	4.78
<b>11</b>	2.98	3.70	5.40	5.41	5.11	5.87
<b>12</b>	3.06	3.60	4.80	6.34	4.78	5.71
<b>13</b>	4.27	3.71	5.24	6.63	5.02	4.23
<b>14</b>	2.74	3.46	4.91	5.68	5.18	5.58
<b>15</b>	2.52	3.95	5.05	5.86	5.46	5.22
<b>16</b>	1.99	3.93	4.83	6.03	4.82	5.75
<b>17</b>	2.07	3.85	4.13	6.34	4.55	5.41
<b>18</b>	1.95	3.95	4.96	5.43	4.55	5.20
<b>19</b>	3.30	3.86	5.27	6.41	4.81	5.27
<b>20</b>	2.59	3.94	4.80	5.06	4.45	5.46
<b>21</b>	2.52	3.65	4.92	5.23	5.27	5.14
<b>22</b>	3.66	3.76	4.64	4.93	5.52	5.40
<b>23</b>	1.41	3.58	5.39	5.98	5.50	5.19
<b>24</b>	2.56	3.64	4.70	5.06	4.55	5.81
<b>25</b>	2.12	3.80	4.89	5.18	5.42	5.29
<b>26</b>	3.64	3.59	5.32	6.36	4.59	6.18
<b>27</b>	2.15	3.54	4.95	6.25	4.79	4.99
<b>28</b>	3.65	4.00	4.50	5.29	5.00	5.08
<b>29</b>	2.25	3.77	4.81	5.30	4.98	4.14
<b>30</b>	3.18	3.30	4.88	6.07	4.51	4.94
<b>31</b>	1.69	3.34	4.24	6.10	5.20	5.67
<b>32</b>	1.86	3.54	4.84	5.63	5.20	6.20
<b>33</b>	2.99	3.54	4.97	5.81	4.19	5.89
<b>34</b>	2.69	4.00	4.73	5.20	4.88	5.41

35	1.95	3.55	4.93	6.06	4.72	5.78
36	2.06	3.97	4.91	7.22	5.64	5.06
37	2.60	3.55	5.08	5.50	5.09	6.34
38	3.07	3.21	4.82	6.16	5.10	5.15
39	1.75	3.84	5.30	5.58	5.19	5.11
40	2.30	3.83	4.95	6.11	4.79	4.80
41	3.17	3.91	4.87	5.39	5.89	4.81
42	2.74	3.20	4.81	6.73	4.73	4.71
43	2.24	3.50	4.68	6.18	4.69	6.01
44	4.22	3.68	4.83	5.78	4.49	5.06
45	2.35	3.80	4.40	6.00	5.06	5.67
46	2.76	3.60	5.12	6.49	5.10	4.34
47	2.82	3.22	5.02	6.77	5.10	4.99
48	3.83	3.74	5.01	5.43	4.29	4.96
49	3.57	3.63	4.51	6.69	5.06	4.69
50	2.88	3.29	4.49	5.44	4.82	4.66
51	1.84	3.80	4.26	5.07	5.03	4.93
52	3.61	3.64	4.89	5.24	5.35	5.62
53	2.78	3.54	5.28	5.59	5.11	5.07
54	2.95	3.45	5.20	6.32	5.14	5.71
55	2.30	3.41	4.62	6.79	4.89	5.28
56	2.25	3.92	4.85	5.68	5.01	4.71
57	2.59	3.45	4.29	6.67	4.86	5.51
58	2.04	3.50	4.77	6.80	5.22	6.04
59	3.79	3.83	4.60	5.95	5.07	5.48
60	2.46	3.66	4.20	4.46	5.00	6.12
61	3.13	3.57	4.82	6.59	4.51	4.72
62	3.89	4.17	4.61	6.18	5.60	4.70
63	2.95	4.04	4.79	6.29	5.02	5.76
64	2.26	3.72	4.93	5.16	5.69	4.70
65	2.73	3.82	5.02	5.26	5.10	5.77
66	2.38	3.10	5.34	6.81	5.38	6.33
67	2.84	3.53	4.45	6.54	5.24	5.69
68	2.69	3.42	4.49	6.69	4.44	4.56
69	3.57	3.41	5.09	5.71	5.40	5.67
70	2.87	3.79	4.88	6.20	4.66	5.72
71	2.50	3.63	5.17	5.94	5.04	4.87
72	2.49	3.52	4.72	5.57	5.11	5.22
73	3.72	3.66	4.94	5.55	5.15	4.81
74	2.32	3.36	5.13	5.93	5.00	5.41
75	2.94	3.22	5.12	6.01	4.89	4.91
76	2.45	3.53	5.18	6.60	4.64	4.64
77	2.26	3.55	4.89	5.60	5.08	5.41

<b>78</b>	2.73	3.83	4.68	5.71	4.88	5.48
<b>79</b>	2.63	3.69	4.47	5.49	4.68	5.16
<b>80</b>	3.18	3.70	4.90	5.61	5.28	5.01
<b>81</b>	3.41	3.75	5.13	5.98	5.31	5.41
<b>82</b>	1.56	3.38	4.13	4.77	5.11	5.18
mean	2.76	3.65	4.83	5.86	4.99	5.28
sd	0.62	0.22	0.30	0.56	0.34	0.50

**Bảng 4.3. Màu sắc nước lên men**

flavour	CT1-24h	CT2-24h	CT3-24h	CT4-24h	CT5-24h	CT6-24h
1	3.48	2.95	4.15	7.40	4.48	4.89
2	3.43	2.96	4.11	7.51	5.66	4.24
3	3.48	3.10	3.94	7.31	4.94	4.99
4	3.35	3.22	4.19	7.40	6.24	4.75
5	3.62	2.99	4.41	7.52	5.41	4.84
6	3.01	2.94	5.60	7.98	4.93	4.79
7	2.76	2.67	3.44	7.16	4.46	5.27
8	3.39	3.18	4.35	7.44	5.09	5.16
9	3.18	2.79	3.94	9.01	5.72	4.87
10	3.38	3.07	4.16	7.63	4.59	5.63
11	2.98	3.19	4.01	8.22	5.09	5.14
12	3.06	3.49	4.91	8.05	5.14	4.42
13	3.53	2.97	4.11	8.02	5.09	4.32
14	3.17	2.80	3.76	9.37	5.51	5.34
15	3.68	3.54	4.80	7.16	4.49	5.05
16	4.00	3.10	3.89	7.95	5.83	4.72
17	2.89	3.29	3.98	7.35	5.91	5.42
18	3.72	3.09	3.79	7.51	6.18	5.89
19	2.75	2.79	4.10	8.09	5.84	5.32
20	3.98	2.55	3.50	9.06	6.54	4.56
21	2.98	2.95	3.03	7.01	6.46	4.80
22	2.73	3.08	3.15	8.11	5.79	5.02
23	3.90	2.98	4.44	7.58	4.94	5.46
24	3.28	3.09	3.75	7.31	5.39	5.38
25	3.76	3.25	4.33	8.26	4.95	5.19
26	3.27	2.93	4.81	6.94	4.51	4.47
27	2.85	2.52	4.33	7.76	4.82	5.01
28	3.41	3.31	4.49	6.24	4.89	4.98
29	3.51	2.75	4.65	7.92	5.49	3.90
30	3.13	2.87	5.15	6.98	5.01	4.84
31	3.47	2.64	4.02	7.64	5.64	5.18
32	3.37	3.31	3.99	8.31	5.71	4.82
33	3.21	2.65	4.07	7.88	4.78	4.50

34	3.08	2.75	4.53	7.26	5.76	4.18
35	3.76	3.07	4.30	7.38	5.08	4.66
36	3.39	2.67	3.62	7.38	4.99	5.42
37	3.17	3.07	4.63	7.47	5.20	4.82
38	3.65	2.97	4.47	7.14	5.15	4.40
39	3.06	3.34	4.45	8.44	4.07	5.01
40	3.25	2.97	4.20	6.80	6.18	4.61
41	3.15	3.21	3.72	7.43	6.29	5.33
42	3.75	3.01	4.42	6.49	5.28	5.14
43	2.62	2.69	3.89	8.18	4.89	5.01
44	3.38	3.41	3.85	6.62	5.01	5.08
45	3.42	3.12	4.06	7.63	5.41	5.18
46	3.50	2.88	4.58	8.18	5.54	4.65
47	3.21	3.25	4.12	7.87	5.52	5.06
48	3.43	2.92	3.90	8.01	5.57	5.29
49	2.93	3.14	5.10	7.70	5.27	5.09
50	2.83	3.50	3.96	6.94	4.97	4.49
51	3.51	3.10	3.76	7.37	4.83	4.75
52	3.21	3.20	4.09	6.96	4.36	5.74
53	3.61	2.66	3.78	6.89	5.27	4.50
54	2.71	2.62	4.71	6.85	5.59	5.12
55	3.12	3.03	4.14	8.25	4.62	4.50
56	3.34	2.66	4.42	7.88	5.50	5.31
57	3.16	2.87	4.07	8.17	6.25	4.45
58	3.76	2.93	4.67	7.64	5.24	4.44
59	2.73	3.04	4.22	7.45	5.31	5.73
60	3.39	3.19	4.41	8.14	4.49	4.22
61	3.30	2.81	4.70	7.05	4.78	4.90
62	3.14	3.03	3.31	6.72	5.84	5.21
63	3.28	2.76	4.08	7.62	5.85	4.62
64	3.28	3.38	4.93	6.75	5.17	4.50
65	2.93	2.96	4.83	8.03	5.75	4.84
66	3.15	3.01	4.03	7.48	4.98	4.33
67	3.56	2.95	4.38	7.83	5.82	4.76
68	3.25	2.91	4.27	7.20	5.44	4.64
69	3.51	3.15	3.96	7.60	4.29	5.32
70	3.66	3.03	5.49	8.29	6.05	5.39
71	3.67	3.77	3.56	6.83	4.39	5.32
72	3.41	3.02	3.61	7.01	5.72	5.68
73	3.23	3.47	3.98	8.62	4.69	4.58
74	3.39	2.93	3.93	8.58	5.72	4.81
75	3.43	2.66	4.18	6.78	5.46	5.82
76	3.37	3.70	4.10	7.37	4.90	4.61

77	2.97	3.29	3.38	7.67	5.67	5.21
78	3.13	2.66	4.22	8.47	5.28	4.98
79	2.89	2.97	4.62	6.75	5.93	4.88
80	3.18	2.57	3.98	7.03	4.82	3.95
81	3.43	3.32	3.40	9.12	5.72	4.68
82	3.11	3.08	4.07	7.76	4.89	4.81
mean	3.29	3.02	4.18	7.61	5.30	4.92
sd	0.31	0.26	0.48	0.63	0.55	0.42

**Bảng 4.4. Độ yêu thích nước lên men**

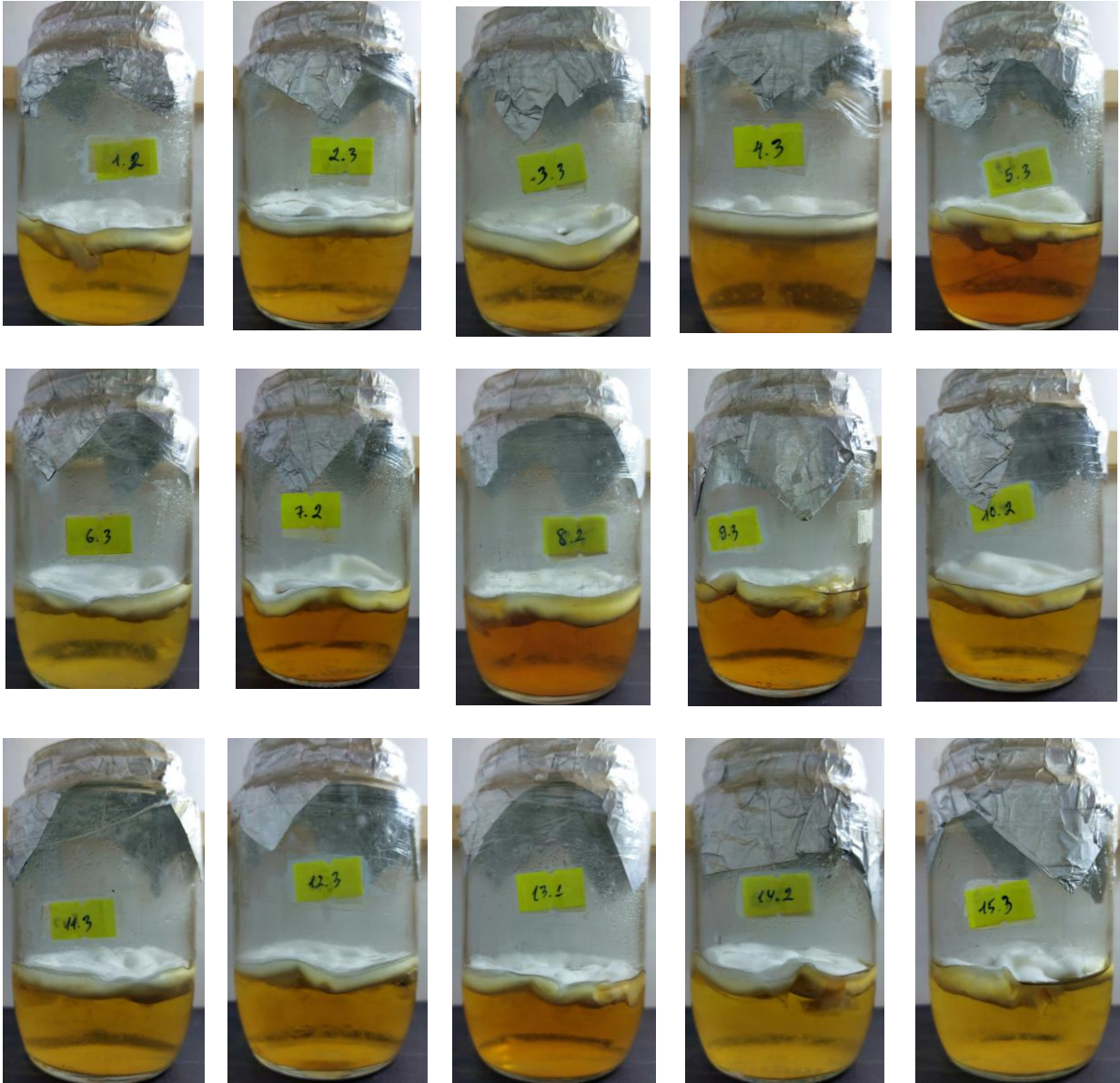
overall liking	CT1-24h	CT2-24h	CT3-24h	CT4-24h	CT5-24h	CT6-24h
1	4.55	6.01	5.46	7.92	6.75	6.46
2	4.62	7.24	5.90	7.40	6.68	5.66
3	4.69	6.12	4.08	7.77	6.64	6.27
4	4.94	5.83	5.71	8.08	7.27	6.56
5	4.39	6.04	6.02	8.15	6.78	6.07
6	4.84	6.28	7.10	7.88	6.43	6.29
7	4.54	6.48	5.50	7.63	7.71	7.33
8	4.88	5.92	5.29	7.90	7.17	6.41
9	4.70	6.37	5.30	7.81	6.46	7.34
10	4.36	6.45	6.26	8.19	5.72	7.43
11	4.11	5.36	5.32	7.70	6.54	7.17
12	4.68	5.53	5.72	8.67	7.56	6.32
13	4.80	5.69	6.62	8.34	7.35	5.96
14	4.53	6.26	5.46	7.90	5.72	7.17
15	4.78	6.18	5.07	7.66	7.06	7.43
16	4.28	6.22	5.15	8.16	7.04	6.35
17	4.30	6.08	6.73	8.14	5.96	6.39
18	4.89	5.56	6.00	7.96	7.53	6.51
19	4.13	6.58	6.13	7.23	7.48	7.14
20	4.31	6.07	3.63	8.38	6.82	6.53
21	4.62	6.53	7.05	8.44	6.28	7.09
22	4.43	6.77	6.23	7.76	7.07	6.45
23	4.53	5.78	4.99	7.74	6.54	6.35
24	4.47	5.74	5.44	8.28	6.47	6.75
25	4.74	6.15	5.66	8.27	5.94	6.32
26	4.48	6.44	4.87	7.28	7.27	6.40
27	4.66	5.96	5.97	8.55	7.44	6.37
28	4.96	5.93	3.66	8.39	7.34	6.32
29	4.64	6.28	5.95	7.63	6.87	5.99
30	4.64	6.47	4.13	7.92	6.88	6.85
31	4.28	6.69	5.05	8.10	7.49	6.45
32	4.60	6.10	5.65	8.50	6.81	6.22

33	4.53	6.07	6.32	7.84	6.77	6.80
34	4.74	6.13	5.31	8.21	7.91	6.60
35	4.72	4.95	5.20	7.51	6.29	6.91
36	4.88	5.65	5.19	8.59	5.88	6.24
37	4.43	5.21	5.76	8.21	7.28	6.76
38	4.62	6.00	6.10	8.19	6.69	7.00
39	4.47	6.71	5.38	7.73	6.27	6.03
40	4.65	6.36	5.83	8.08	7.97	6.50
41	4.98	5.37	6.29	8.29	7.26	6.87
42	4.43	6.12	6.14	8.33	7.12	6.32
43	4.42	6.05	5.09	8.03	7.21	7.55
44	4.15	5.25	4.62	8.48	5.99	7.59
45	4.44	6.82	5.51	8.40	6.60	5.48
46	4.98	5.97	5.86	8.08	6.84	6.53
47	4.50	5.79	6.16	8.04	6.91	6.90
48	4.61	6.80	6.17	8.91	6.70	6.44
49	4.67	4.99	4.54	8.42	7.15	6.57
50	4.74	5.38	5.18	8.15	8.09	6.80
51	4.70	6.30	5.83	7.34	6.98	6.54
52	4.61	5.95	5.15	8.34	6.63	6.31
53	4.51	6.88	5.39	7.68	6.74	7.32
54	4.83	6.97	5.26	8.06	6.43	6.65
55	4.57	6.65	6.71	7.87	6.36	6.72
56	4.57	6.97	5.68	8.50	7.40	6.43
57	4.84	5.59	6.41	8.41	7.74	6.77
58	4.71	5.55	4.07	8.32	6.30	6.81
59	5.07	5.80	5.67	8.18	5.55	6.51
60	4.55	6.46	7.19	8.08	6.60	6.57
61	4.58	5.12	5.50	8.30	6.55	5.79
62	4.69	4.30	4.79	7.96	6.79	6.79
63	4.54	5.06	5.16	7.92	6.19	5.97
64	4.71	6.22	5.05	7.92	7.22	5.48
65	4.53	6.05	4.50	7.84	6.05	6.52
66	4.42	4.85	4.81	7.82	5.82	7.08
67	4.48	6.39	5.34	8.26	6.63	6.68
68	4.76	5.14	5.99	8.43	6.99	6.66
69	4.86	6.73	5.01	8.07	6.68	7.02
70	4.50	6.61	5.47	7.96	6.71	6.24
71	4.49	5.08	5.52	7.60	6.52	6.86
72	4.60	6.28	5.28	7.92	6.19	6.69
73	4.44	6.34	6.92	7.79	7.54	6.60
74	5.17	5.66	5.28	8.76	6.97	6.32
75	4.39	5.84	5.11	9.08	6.23	7.42

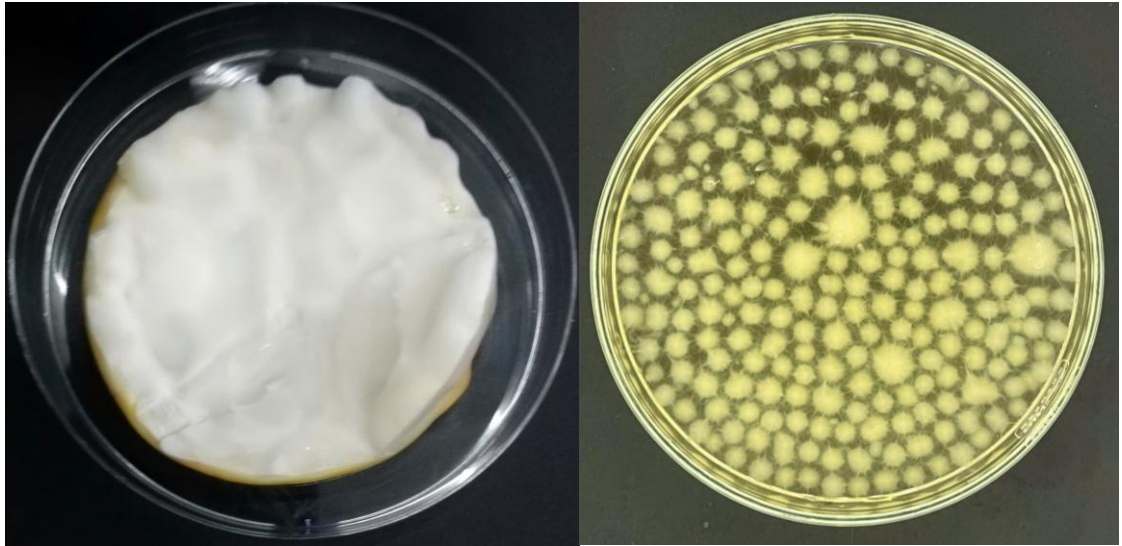
76	4.33	7.33	5.55	8.82	7.11	6.32
77	4.85	5.47	5.42	7.90	7.26	5.52
78	4.50	5.19	5.71	8.64	7.57	6.49
79	4.56	5.45	5.86	8.08	5.75	6.58
80	4.56	6.56	5.83	8.12	7.29	7.13
81	4.42	5.83	4.97	8.44	7.09	7.00
82	4.52	5.61	5.18	7.93	6.41	7.01
mean	4.60	6.01	5.53	8.09	6.81	6.60
sd	0.21	0.59	0.71	0.36	0.57	0.46

## PHỤ LỤC 5. HÌNH ẢNH THÍ NGHIỆM

### 5.1. Sợi nấm *C. militaris* nuôi cấy lỏng







## 5.2. Bột sợi nấm sấy khô



### 5.3. Lên men nước Lactic sợi nấm Vân chi



### 5.4. Hình ảnh vi khuẩn phương đánh giá prebiotic



*L. plantarum* WCFS1



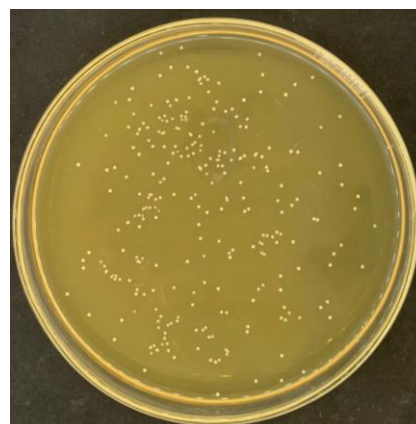
*L. casei* 01



*L. pentosus* NH1



*B. animalis* YC-381



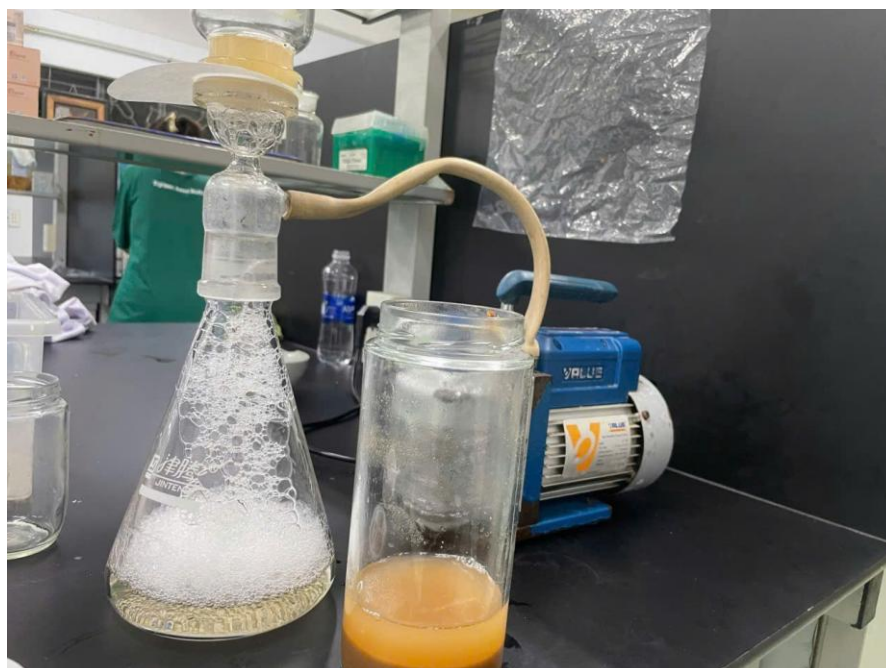
*P. acidilactici* NBD8



### 5.5. Tủ nuôi kỵ khí đánh giá hoạt tính prebiotic PS



### 5.6. Tách chiết PS từ nấm



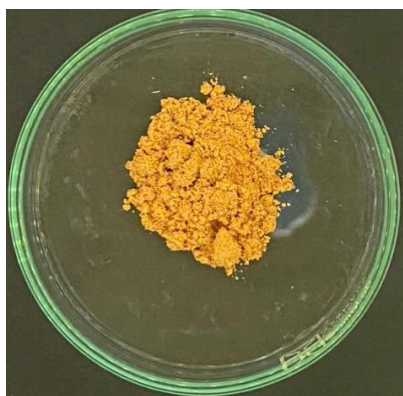
### 5.7. Máy UV-Vis



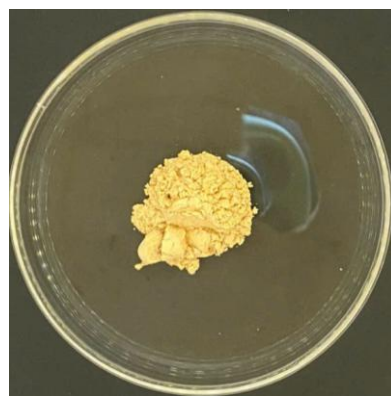
### 5.8. Các phân đoạn PS tách chiết từ sợi nấm



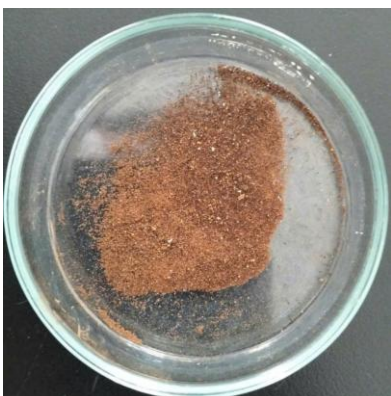
W-PSC



S-PSC



A-PSC



W-PST

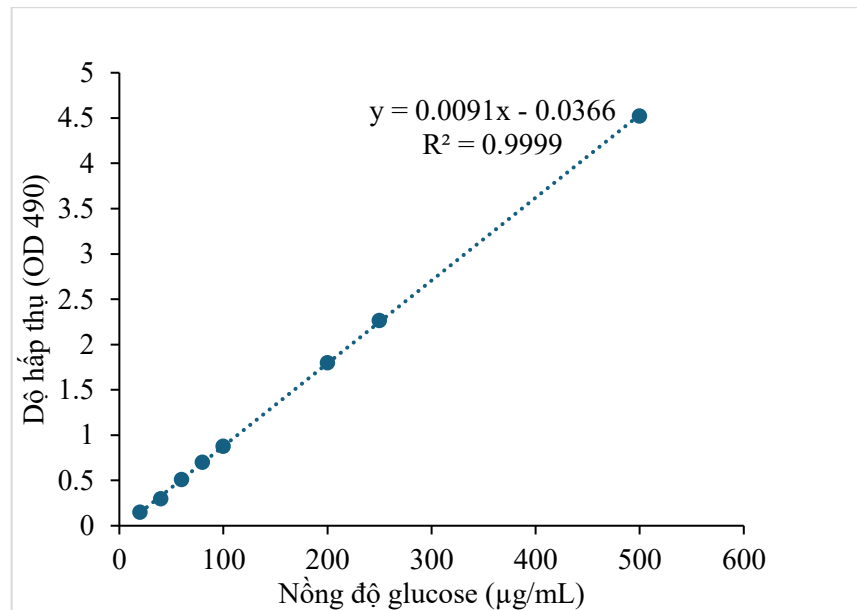


S-PST

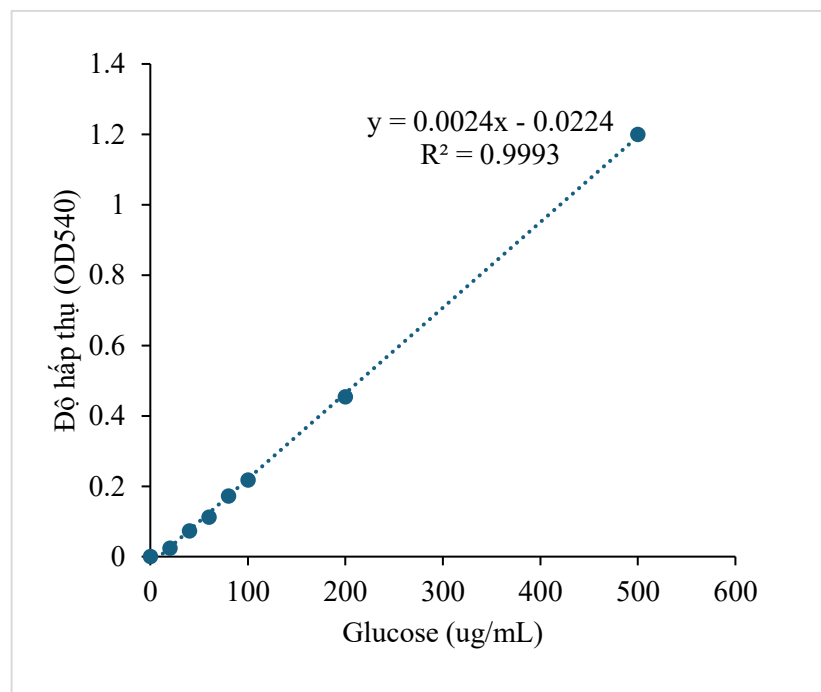


A-PST

### 5.9. Đường chuẩn glucose của phương pháp phenol-sunfuric

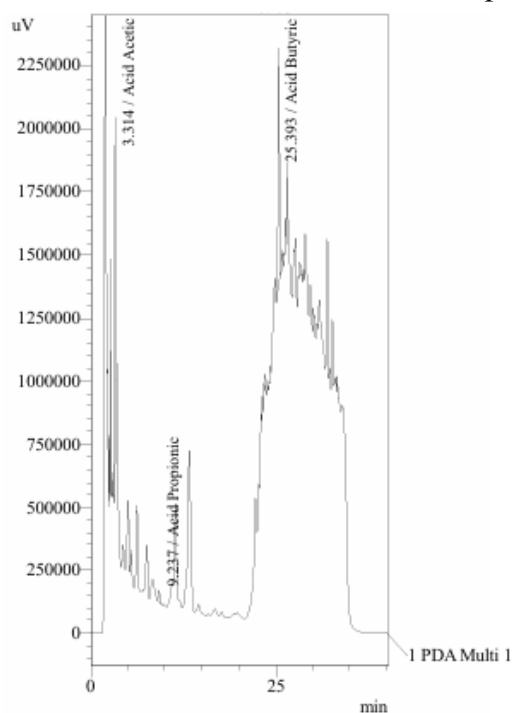


### 5.10. Đường chuẩn DNS

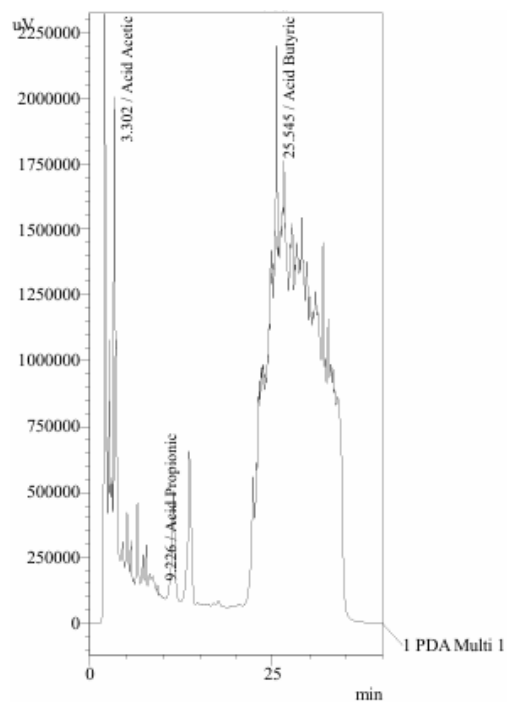


## 5.11. Sắc ký đồ SCFAs nuôi cấy probiotic bổ sung chiết xuất PS nấm *C. militaris*

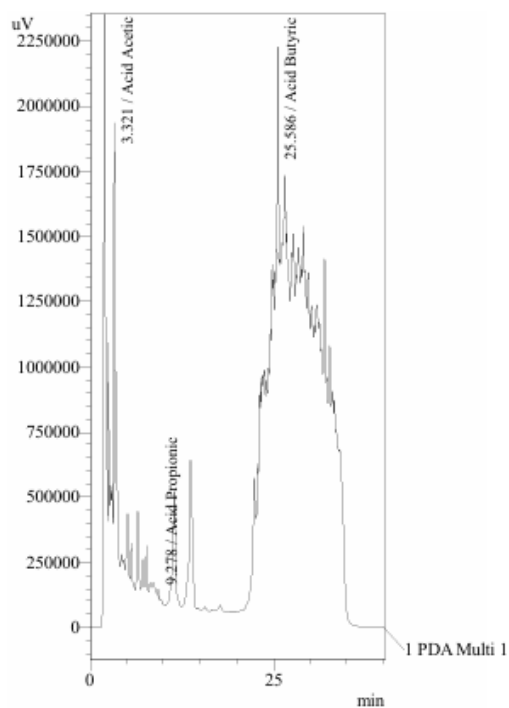
*L. pentosus* NH1



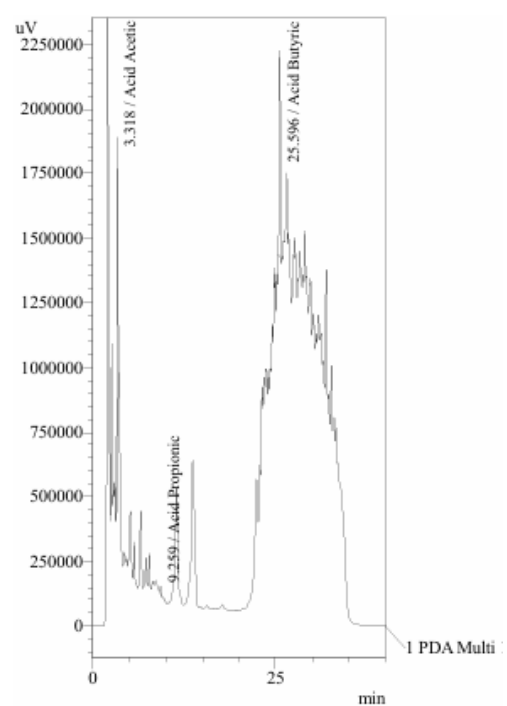
W-PSC



S-PSC

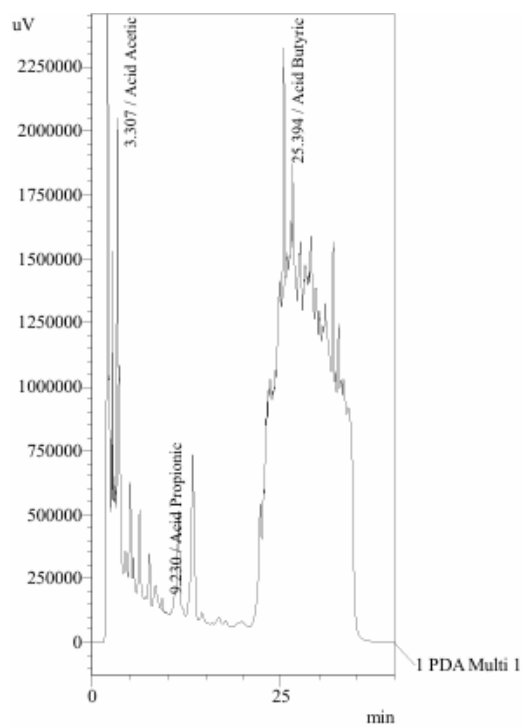


A-PSC

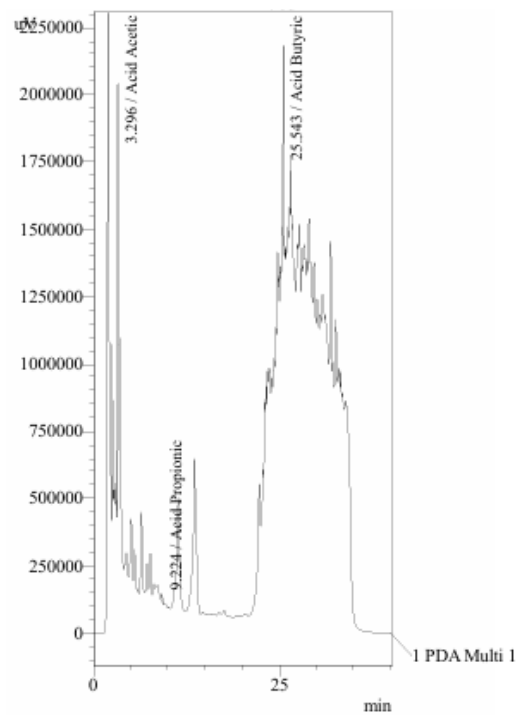


FOS

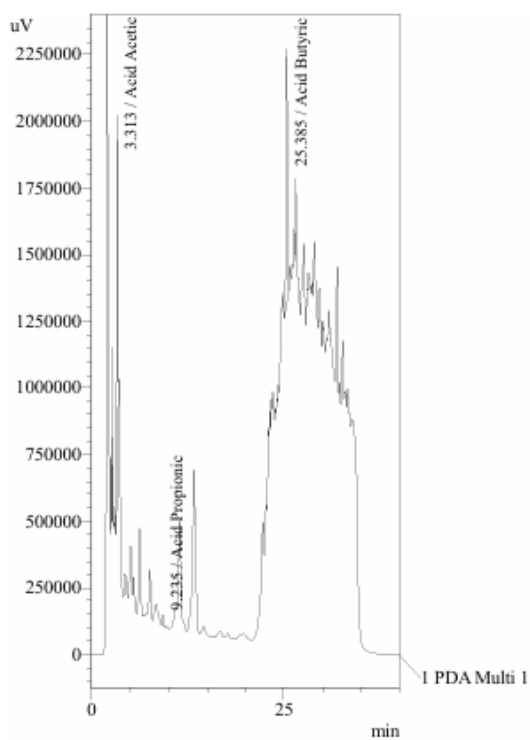
*L. Plantarum* WCFS1



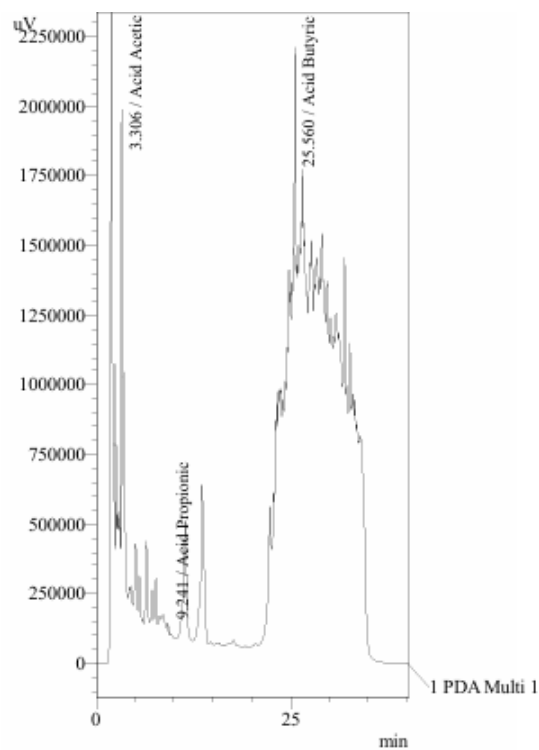
W-PSC



S-PSC

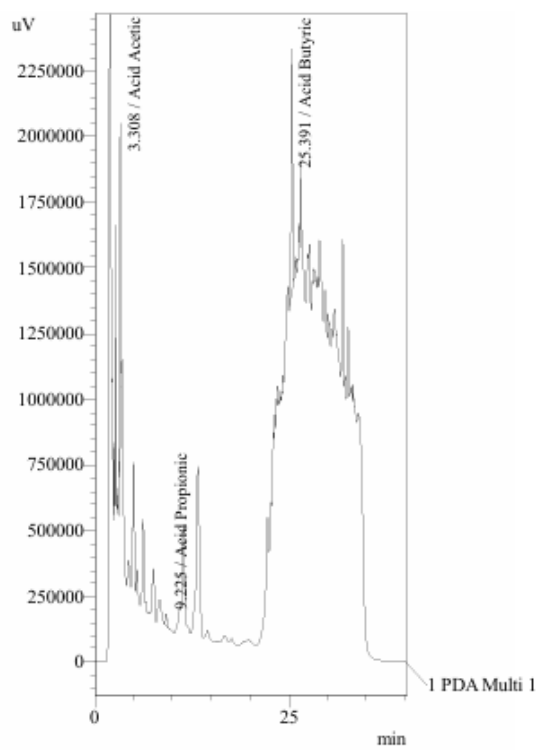


A-PSC

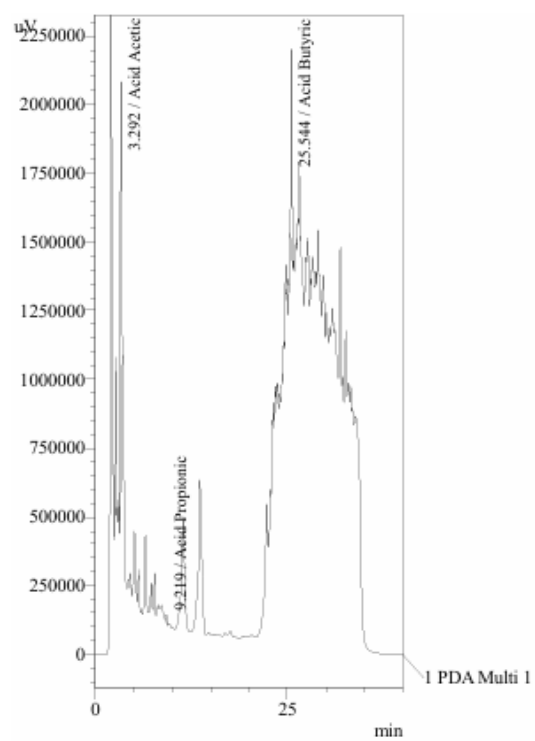


FOS

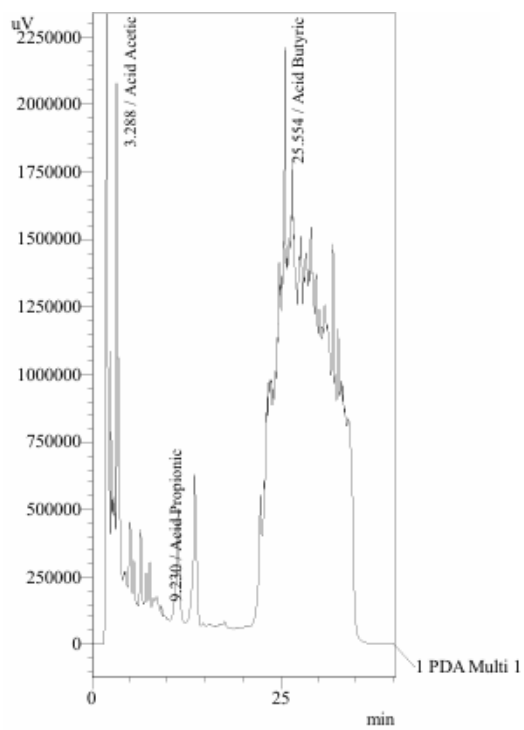
*P. acidilactici* NBD8



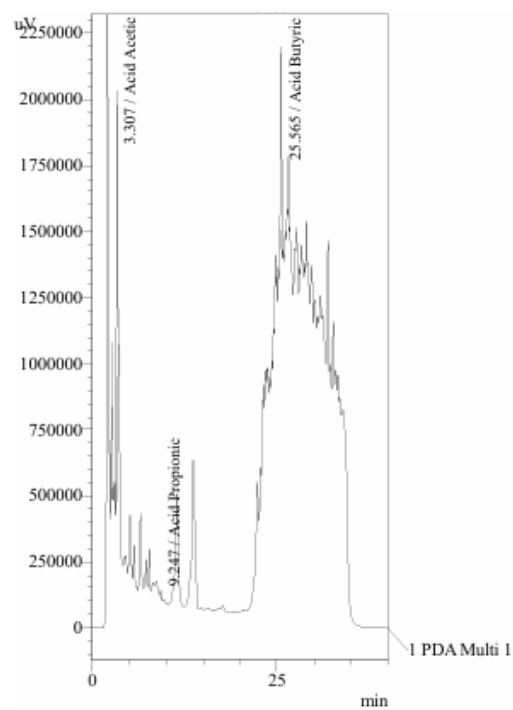
W-PSC



S-PSC



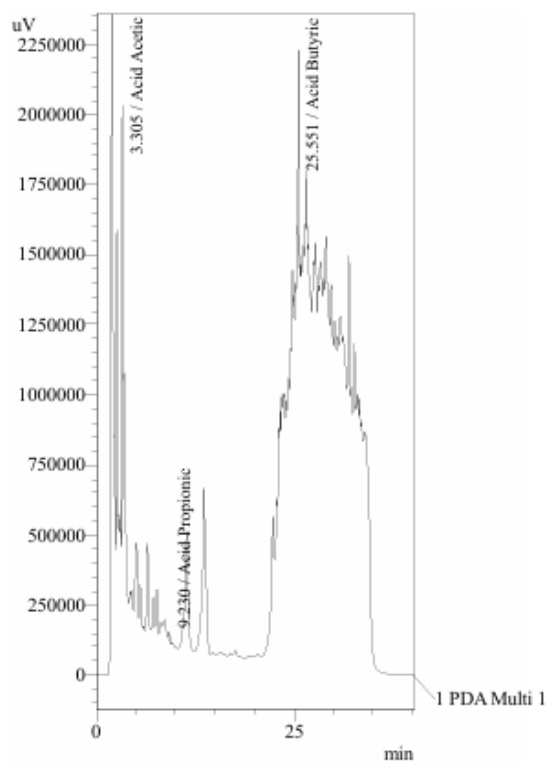
A-PSC



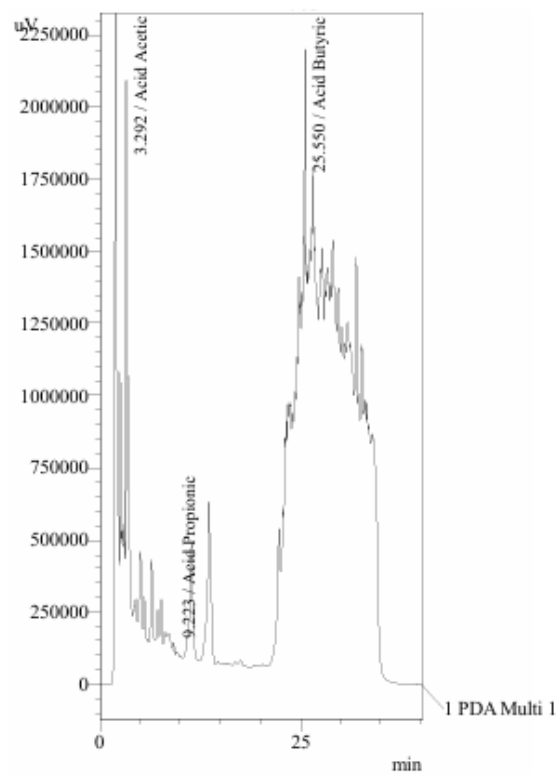
FOS

*B. animalis* YC 381

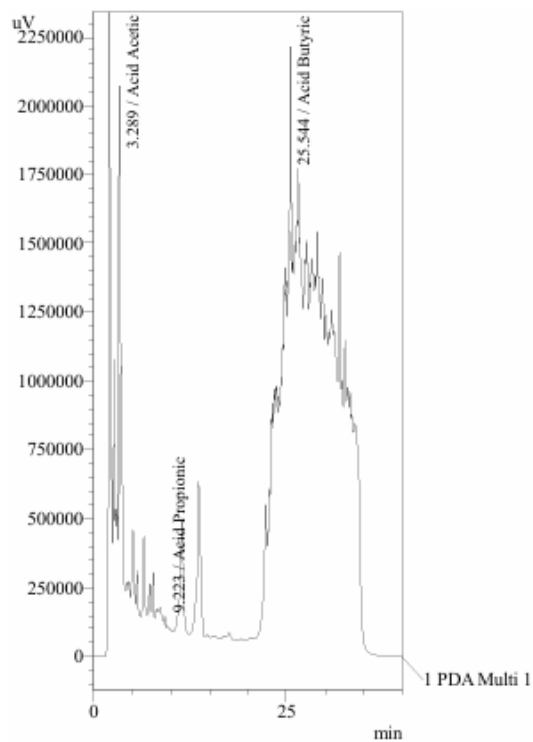




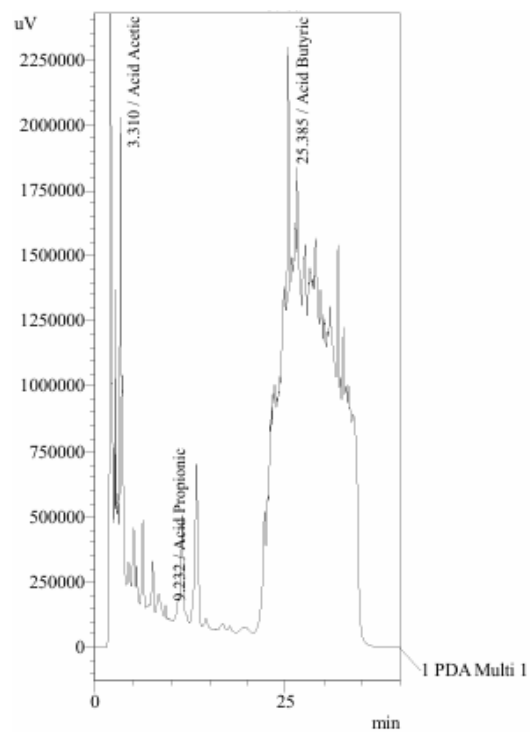
W-PSC



S-PSC

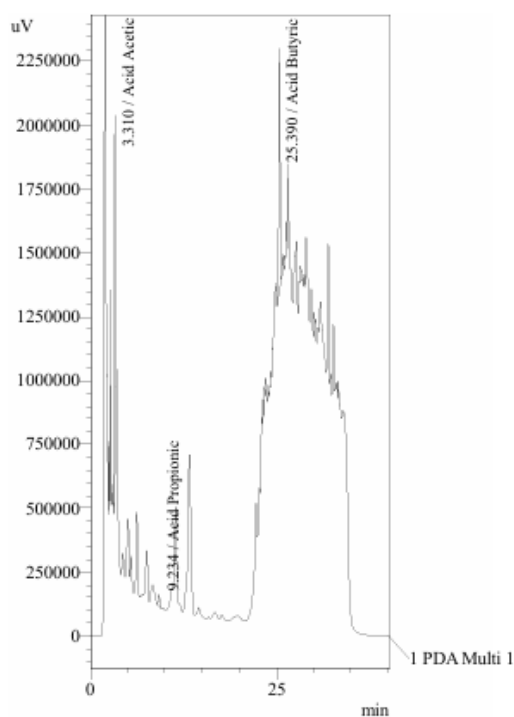


A-PSC

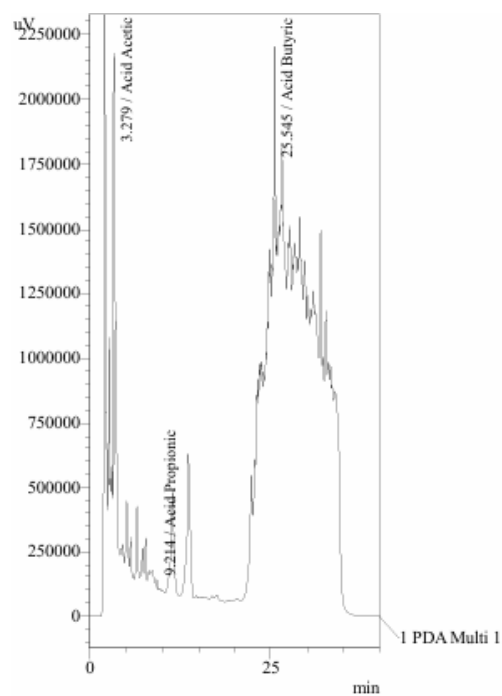


FOS

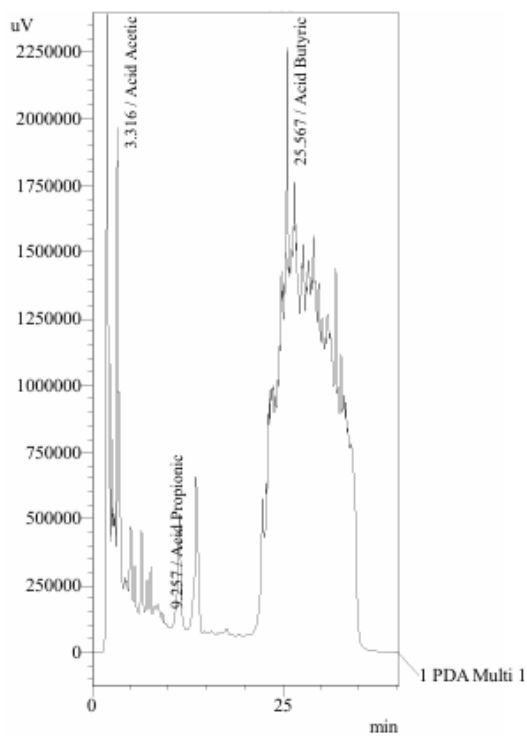
*L. casei* 01



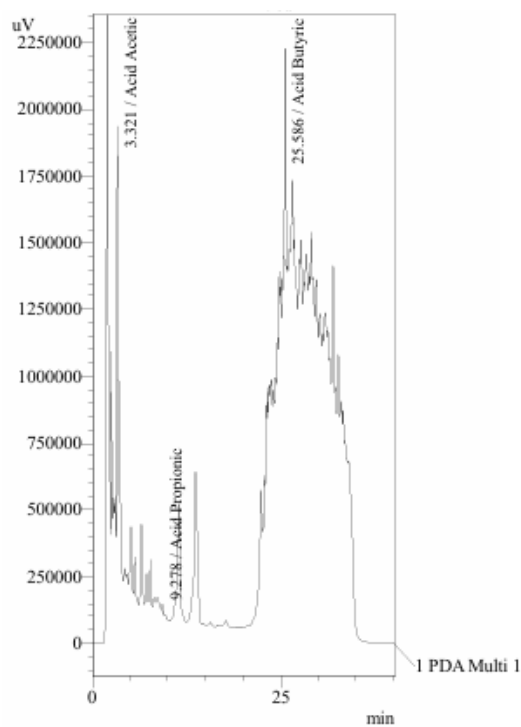
W-PSC



S-PSC

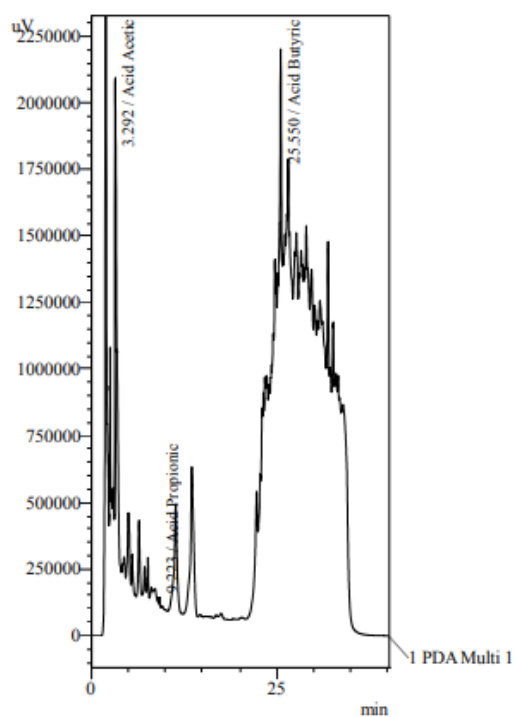


A-PSC

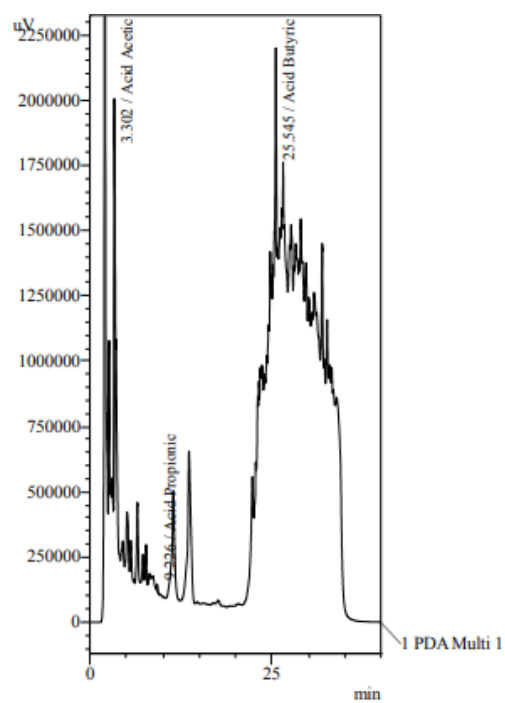


FOS

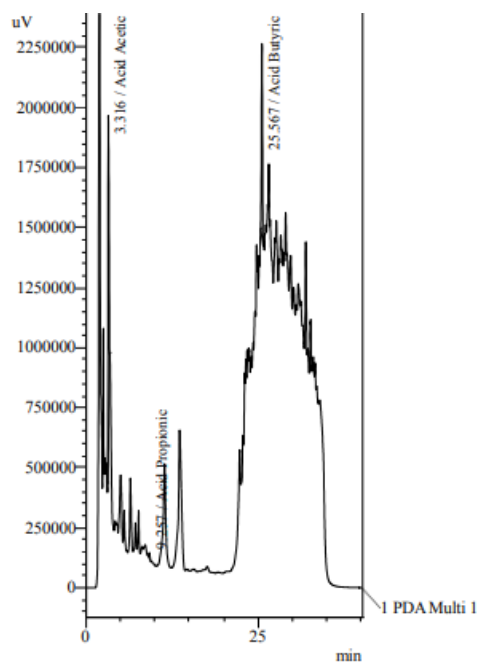
## 5.12. Sắc ký đồ SCFAs nuôi cấy probiotic bổ sung chiết xuất PS nấm *T. versicolor* *L. pentosus* NH1



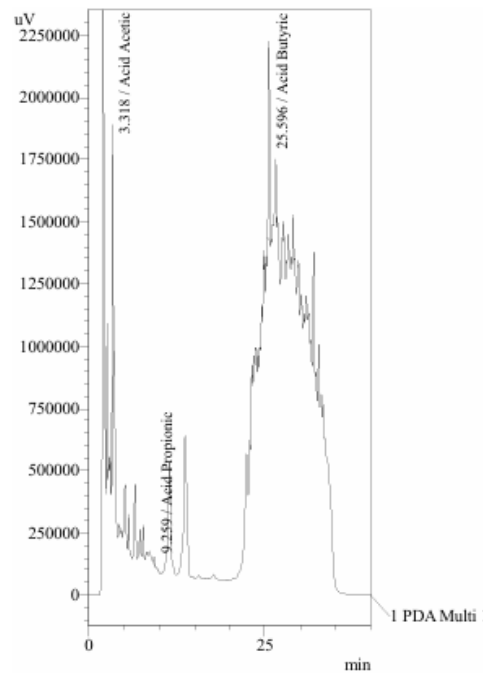
W-PST



S-PST

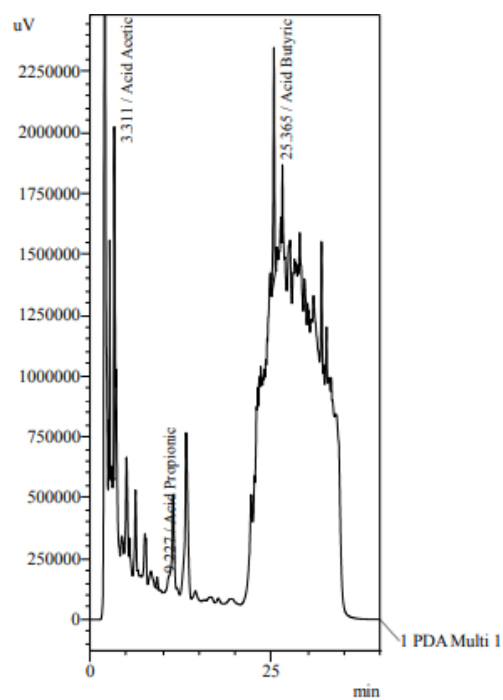


A-PST

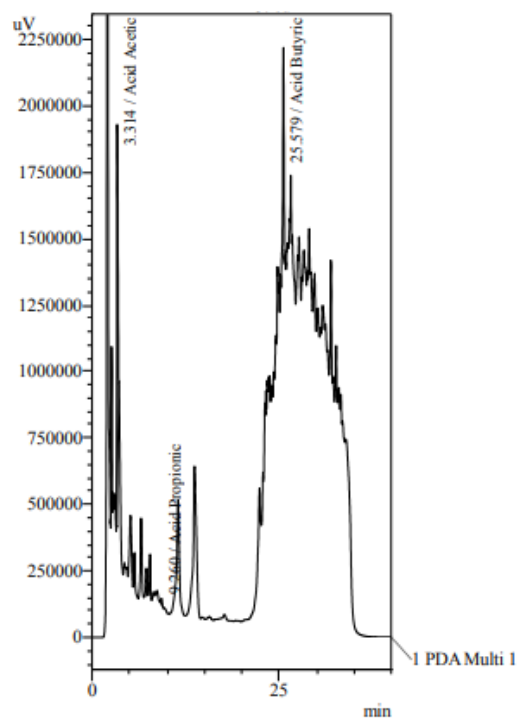


FOS

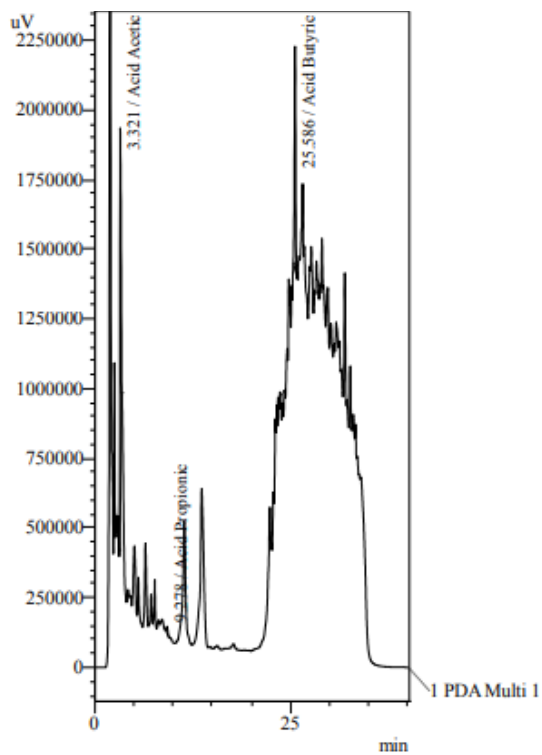
*L. Plantarum* WCFS1



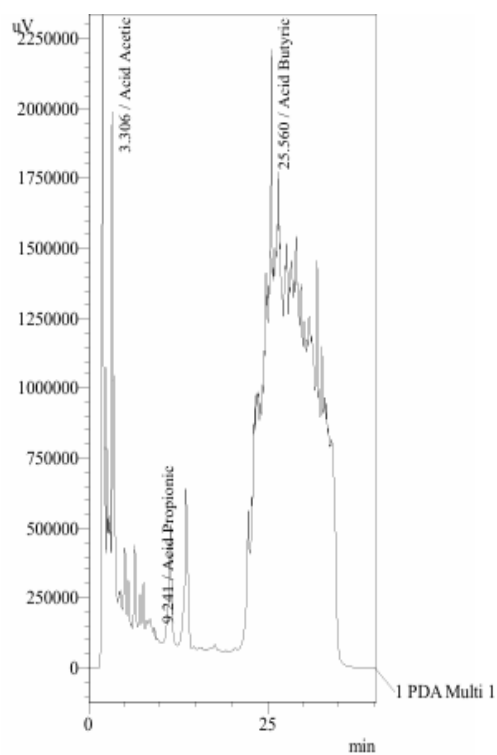
W-PST



S-PST

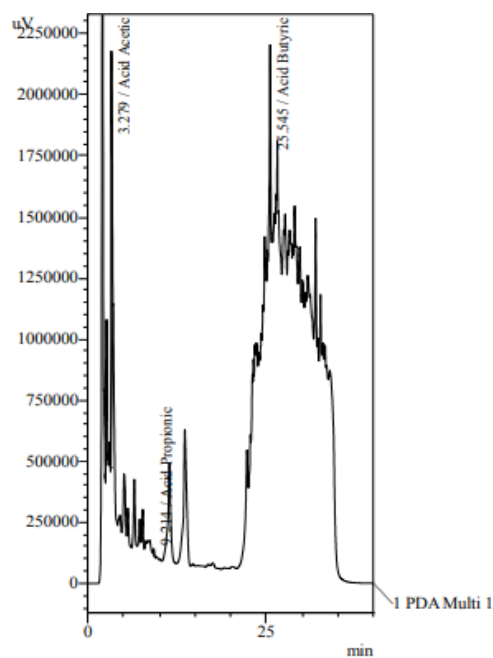


A-PST

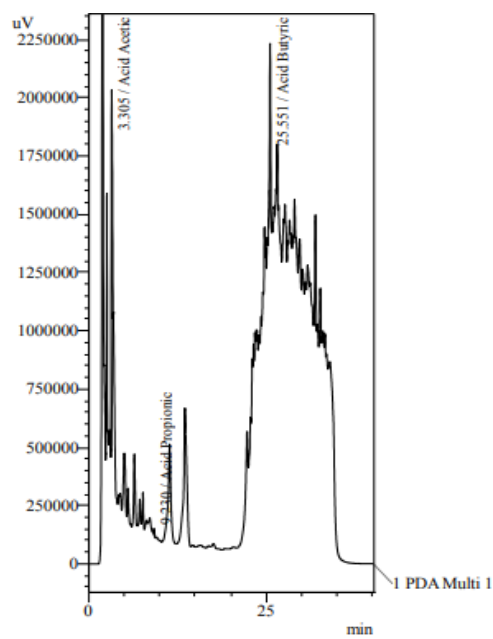


FOS

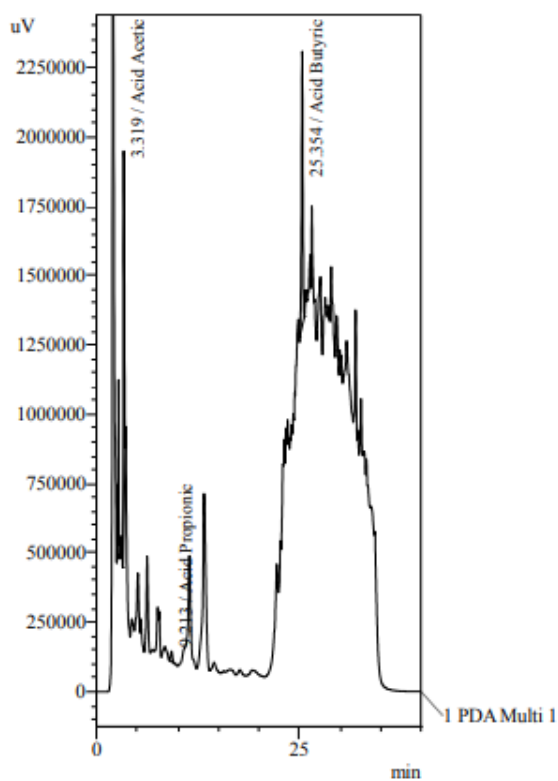
*P. acidilactici* NBD8



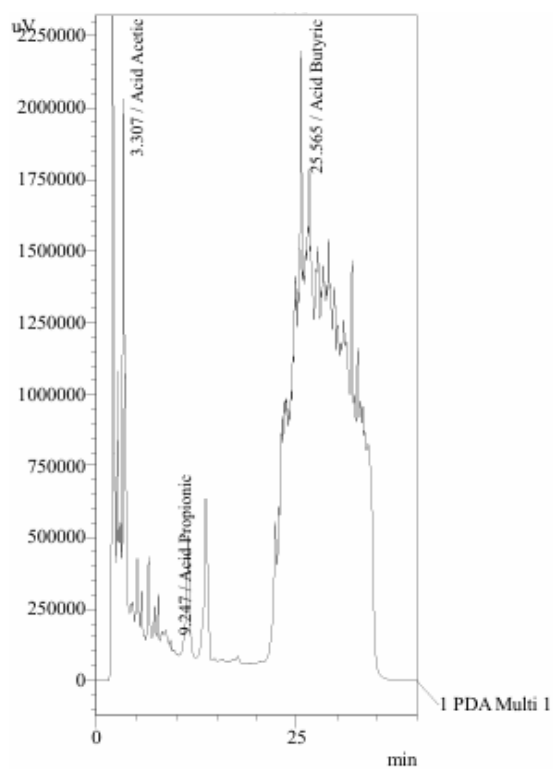
W-PST



S-PST

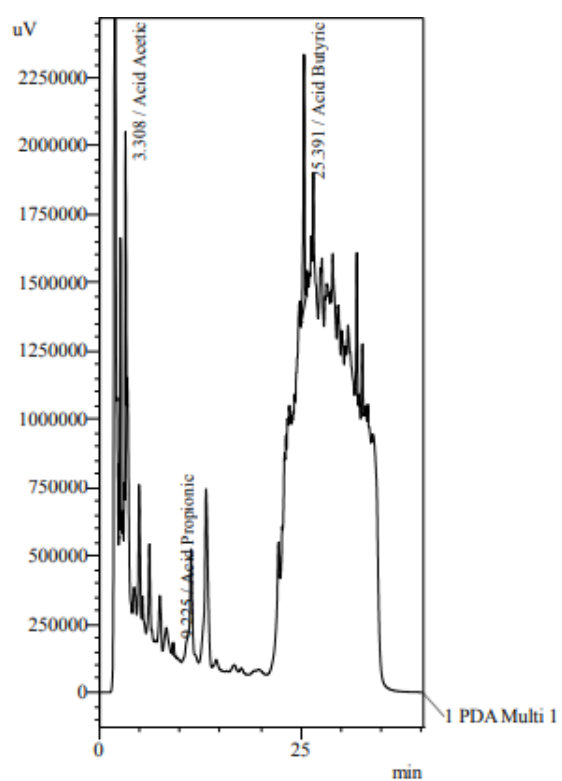


A-PST

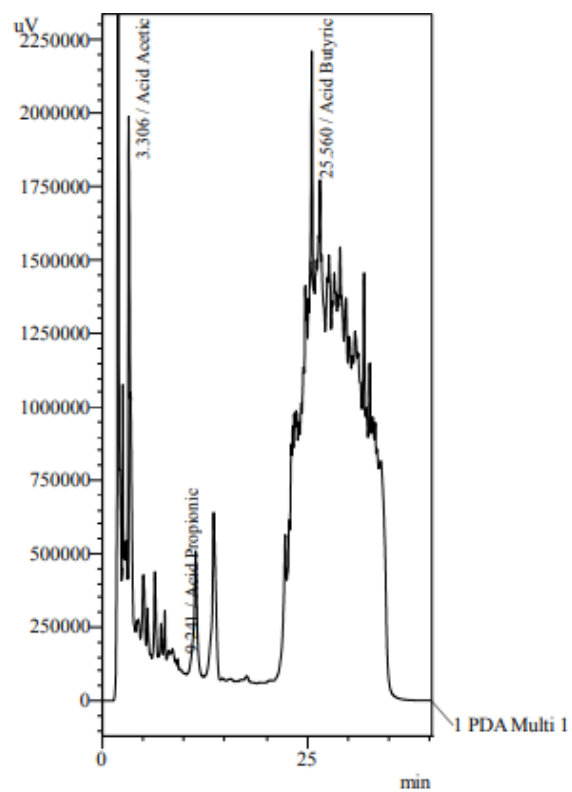


FOS

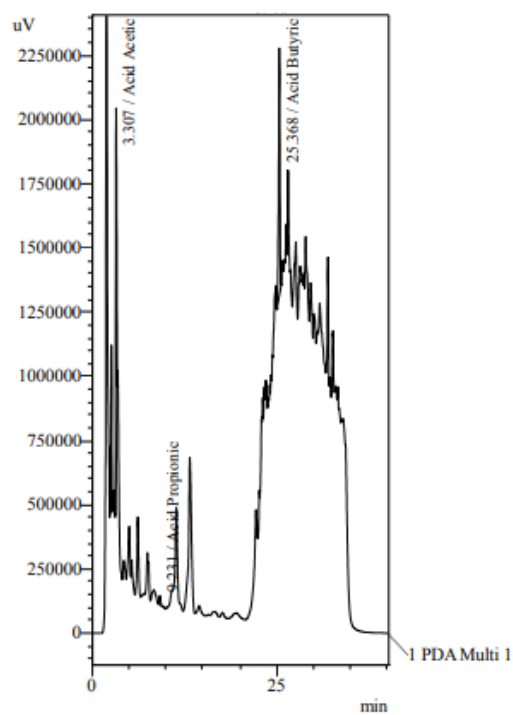
*B. animalis* YC 381



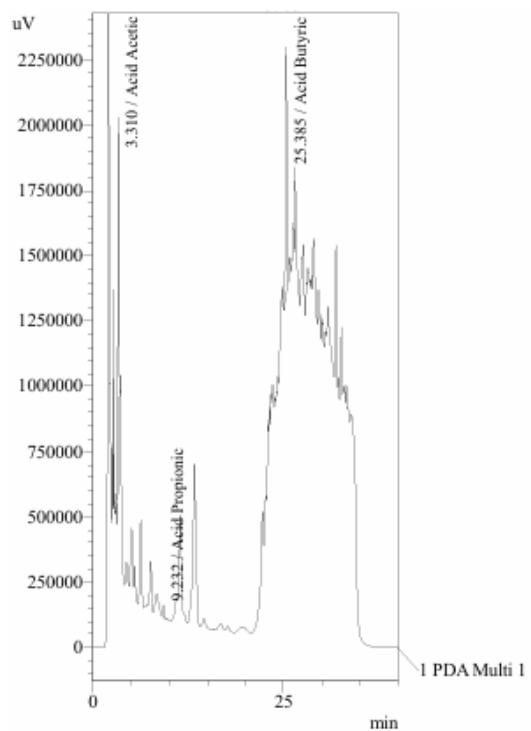
W-PS



S-PST

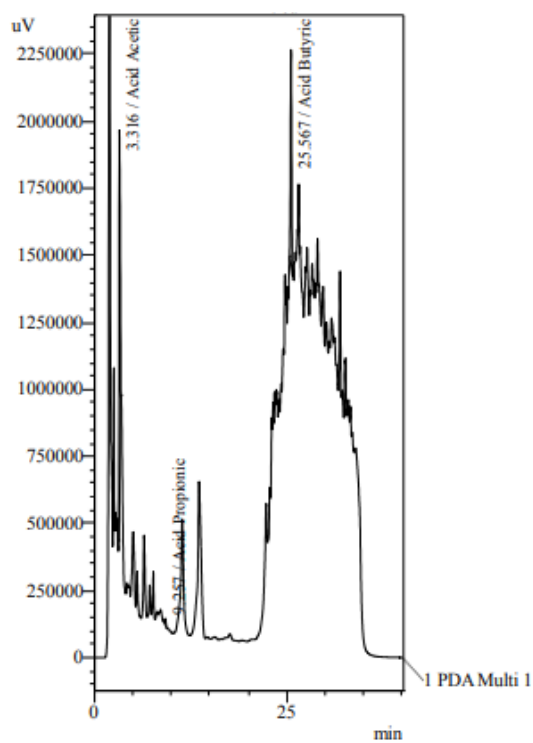


A-PST

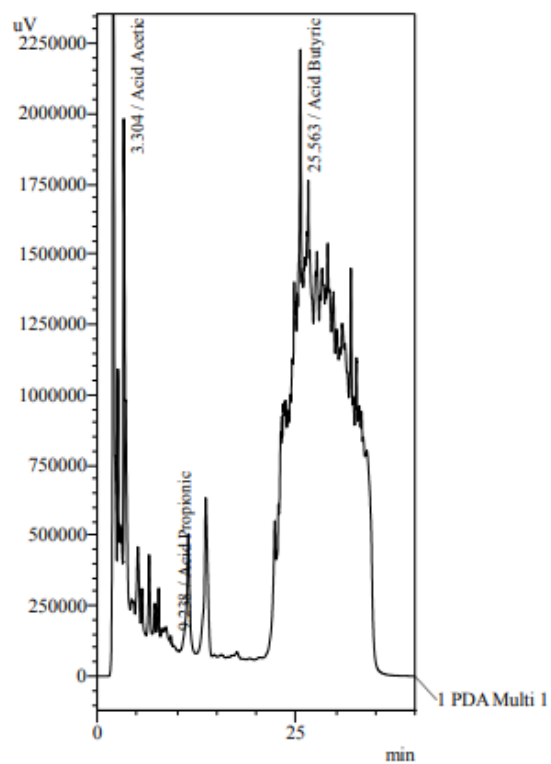


FOS

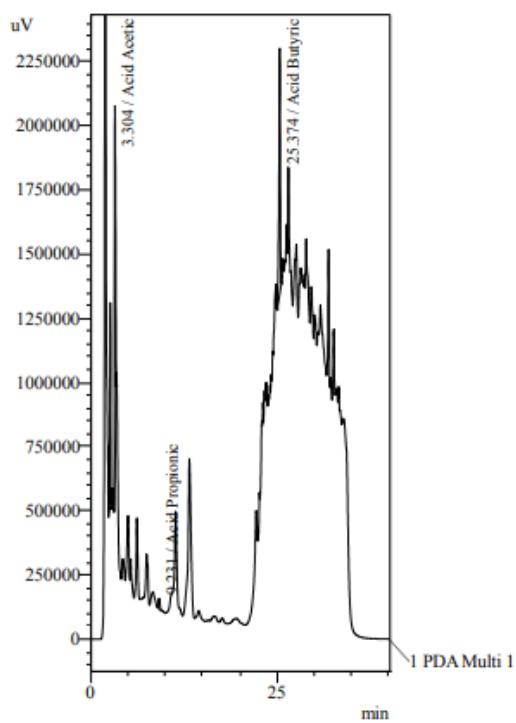
*L. casei* 01



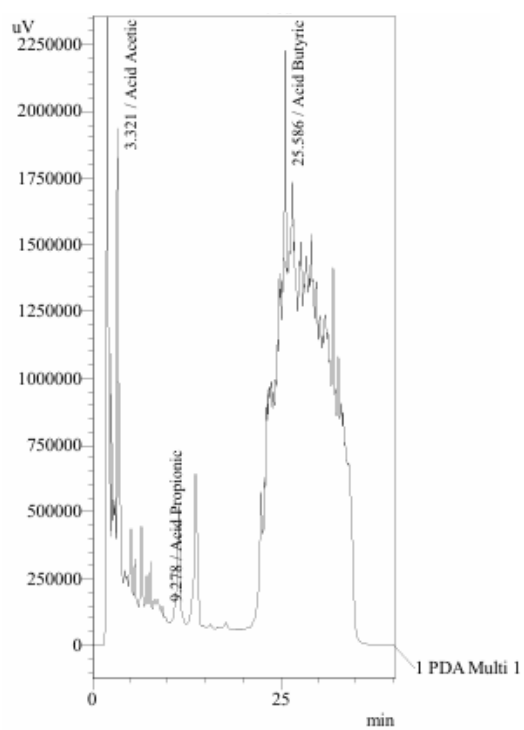
W-PST



S-PST

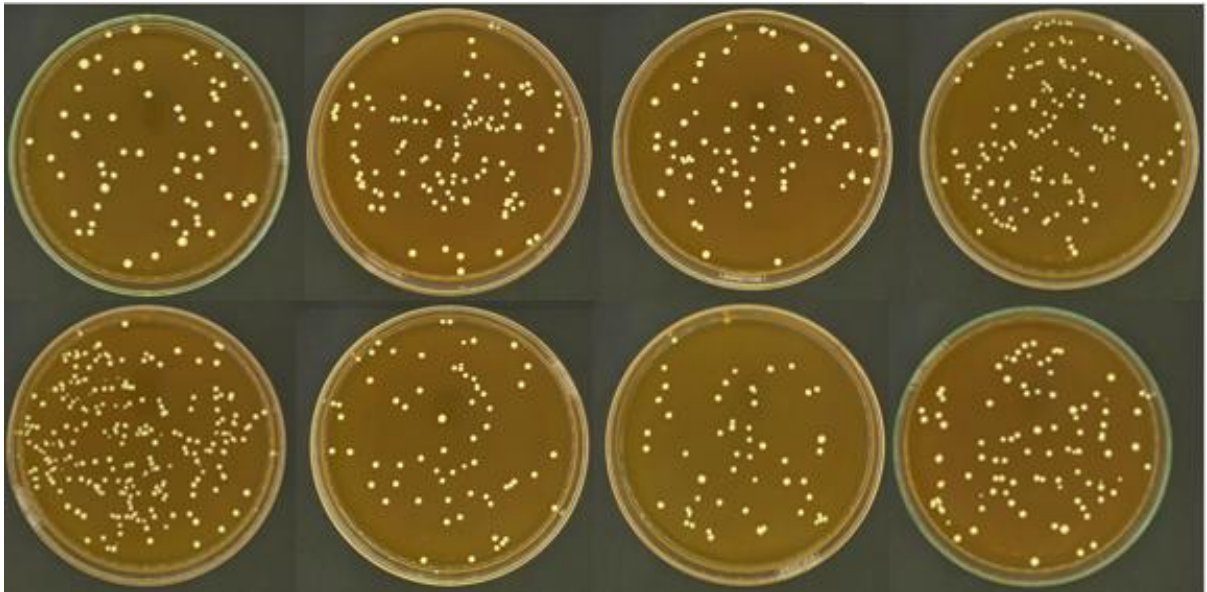
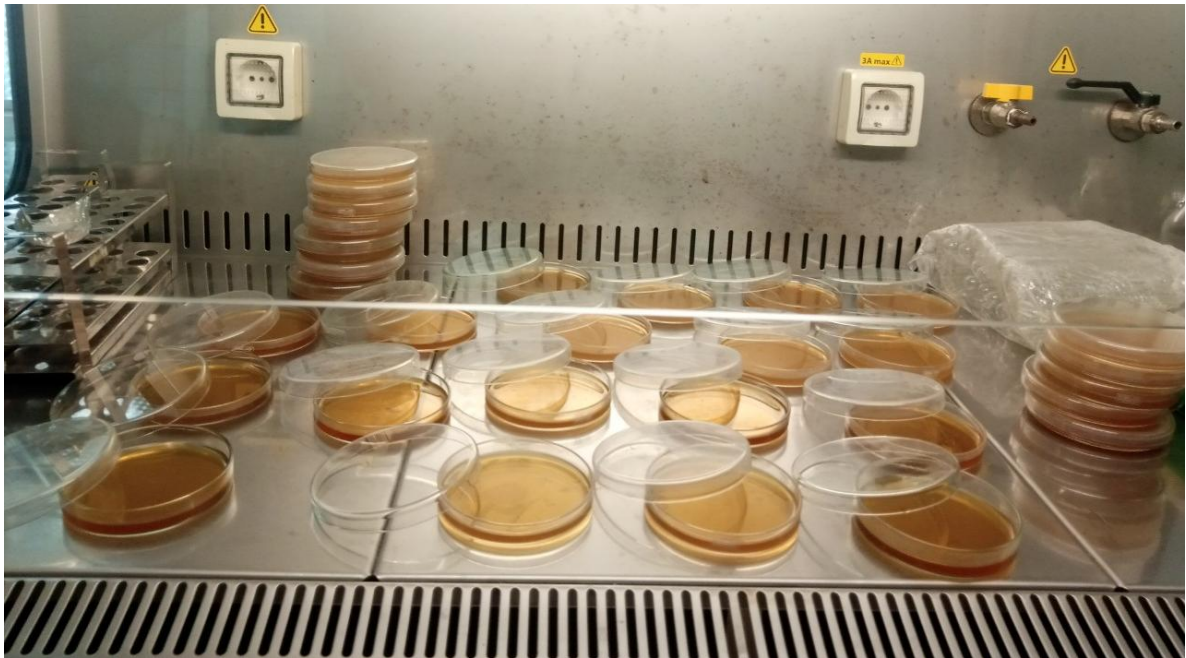


A-PST



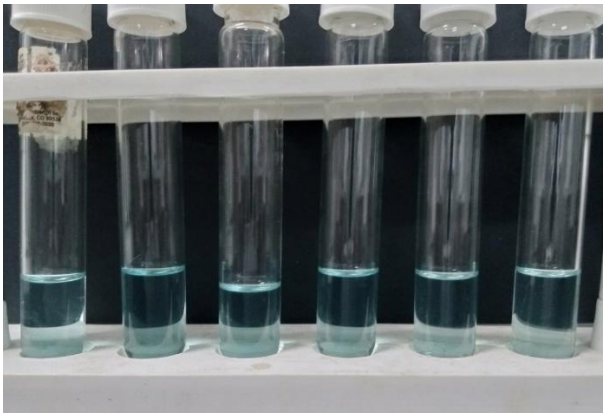
FOS

### 5.13. Cấy trải đĩa xác định mật độ tế bào

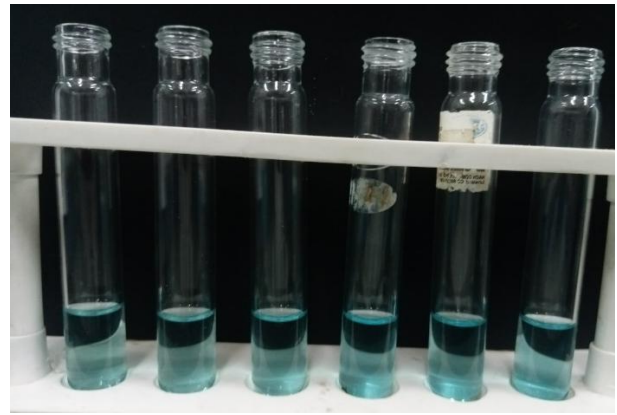




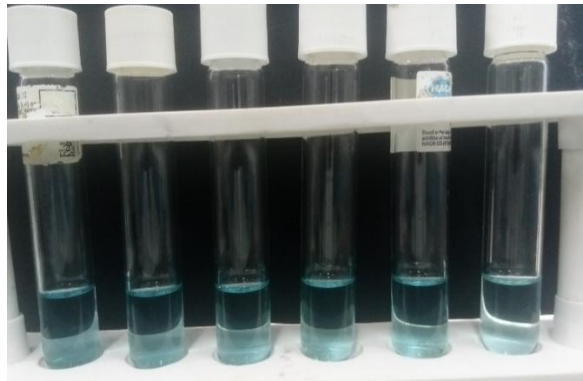
#### 5.14. Khả năng bắt gốc tự do ABTS<sup>+</sup>



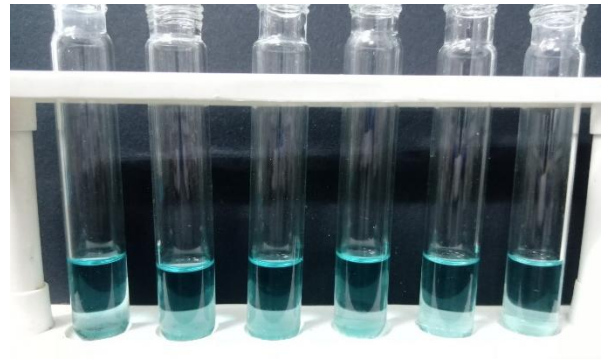
0 giờ



12 giờ



24 giờ




48 giờ

#### 5.15. Nước lên men lactic




## 5.16. Phiếu đánh giá nước lên men lactic



**TỔNG CỤC TIÊU CHUẨN ĐO LƯỜNG CHẤT LƯỢNG**  
DIRECTORATE FOR STANDARDS, METROLOGY AND QUALITY

**TRUNG TÂM KỸ THUẬT TIÊU CHUẨN ĐO LƯỜNG CHẤT LƯỢNG 2**  
QUALITY ASSURANCE AND TESTING CENTER 2 (QUATEST 2)

Địa chỉ: 02 Ngõ Quỳnh, quận Sơn Trà & 97 Lý Thái Tổ, quận Thanh Khê, thành phố Đà Nẵng  
Address: No. 02 Ngõ Quỳnh, Sơn Trà District & No. 97 Lý Thái Tổ, Thanh Khê District, Da Nang City  
Trung tâm Kỹ thuật Tiêu chuẩn Đo lường Chất lượng 2, phường Tân An, thành phố Buôn Ma Thuột, tỉnh Đắk Lắk  
Central Highlands Technical Center: Block 8, Tân An Ward, Buon Ma Thuot City, Dak Lak Province  
Điện thoại/Tel.: (0236) 3848376; (0262) 3796999; Fax: (0236) 3910064  
Email: info@quatest2.gov.vn - Website: quatest2.gov.vn



Số: 2156-K12/5798/KT2-HC2
Ngày: 13/10/2023
Trang: 1/1

### PHIẾU KẾT QUẢ THỬ NGHIỆM

#### TEST REPORT

1. Tên mẫu: **MẪU NƯỚC DỊCH CHIẾT NẤM BẢO NGƯ TÍM LÊN MEN LACTIC**

2. Ký hiệu mẫu: **-**

3. Số lượng mẫu: **01**

4. Tình trạng mẫu: **Mẫu khoảng 70 mL, được chứa trong lọ thủy tinh**

5. Khách hàng: **KHOA SINH – MÔI TRƯỜNG – ĐẠI HỌC SƯ PHẠM - ĐHQN**

6. Địa chỉ: **459 Tôn Đức Thắng, Đà Nẵng**

7. Ngày nhận mẫu: **04/10/2023**

8. Ngày thử nghiệm: **từ ngày: 04/10/2023 đến ngày: 13/10/2023**


9. Kết quả thử nghiệm:

TT	CHỈ TIÊU, ĐƠN VỊ TÍNH	PHƯƠNG PHÁP THỬ	KẾT QUẢ THỬ NGHIỆM
1.	Tổng số vi sinh vật hiếu khí CFU/mL	TCVN 4884-1:2015	KPH (< 1)
2.	Tổng số bào tử nấm men – nấm mốc CFU/mL	TCVN 8275-1:2010	KPH (< 1)
3.	Coliforms CFU/mL	TCVN 6848:2007	KPH (< 1)
4.	E.coli CFU/mL	TCVN 7924-2:2008	KPH (< 1)
5.	Staphylococci có phản ứng dương tính với Coagulase (S.aureus và các loài khác) CFU/mL	ISO 6888-1:2021	KPH (< 1)
6.	Cl.perfringens CFU/mL	TCVN 4991:2005	KPH (< 1)
7.	Hàm lượng Cd mg/L	AOAC 999.11	<0,05 (MQL)
8.	Hàm lượng Pb mg/L	AOAC 999.11	<0,05 (MQL)
9.	Hàm lượng Hg mg/L	AOAC 971.21	<0,05 (MQL)

Ghi chú:

- KPH: không phát hiện;
- MQL: giới hạn định lượng của phương pháp;
- Kết quả thử nghiệm chỉ có giá trị trên mẫu thử do khách hàng gửi;
- Tên mẫu, ký hiệu mẫu, tên khách hàng và địa chỉ được ghi theo yêu cầu khách hàng;
- Phiếu kết quả này không được trích sao nếu chưa có sự đồng ý bằng văn bản của Trung tâm Kỹ thuật 2;
- Trung tâm Kỹ thuật 2 không chịu trách nhiệm khi thông tin cung cấp bởi khách hàng có thể ảnh hưởng đến giá trị sử dụng của kết quả.

**KT. TRƯỞNG PHÒNG KỸ THUẬT 12**  
**PHÓ TRƯỞNG PHÒNG, PHỤ TRÁCH**




**Trương Thị Bé**

**KT. GIÁM ĐỐC**  
**PHÓ GIÁM ĐỐC**



**Ngô Thị Như Loan**




KT2.QT.30/B.05 (V)/02.4.2019