

## Lampiran 1. Surat Izin Penelitian



KEMENTERIAN RISET, TEKNOLOGI, DAN PENDIDIKAN TINGGI  
UNIVERSITAS NEGERI MEDAN  
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM

Jl. Willem Iskandar Psr V – Kotak Pos No.1589 Medan 20221 Telp.(061) 6625970

Laman : [www.fmipa.unimed.ac.id](http://www.fmipa.unimed.ac.id)

Nomor : 1267 /UN33.4.1/LT/2017 Medan, 26 Mei 2017  
Lampiran : 1 (satu) berkas Proposal Penelitian  
Perihal : Izin Melaksanakan Penelitian  
Kepada Yth. : Sdr. Kepala Balai Laboratorium Kesehatan Medan  
di  
Tempat

Dengan hormat, kami memohon bantuan Saudara agar dapat memberikan izin melaksanakan penelitian di instansi yang Saudara pimpin kepada mahasiswa kami tersebut di bawah ini :

Nama : Rr Shofiyah Nur Rahmah  
NIM : 4133220033  
Jurusan : Biologi  
Program Studi : S-1 Biologi  
Dosen Pembimbing : Dr. Syahmi Edi, M.Si  
Judul Penelitian : Pengaruh Lama Penyimpanan Daging Ayam pada Suhu Ruang Terhadap Angka Lempeng Total Bakteri dan Pemeriksaan Adanya Bakteri Salmonella sp.

Perlu diketahui bahwa kegiatan ini dilaksanakan untuk memperoleh data yang akan digunakan dalam penyusunan skripsi mahasiswa tersebut guna memenuhi salah satu syarat memperoleh gelar Sarjana Sains (S.Si) di FMIPA Unimed.

Demikian kami sampaikan, atas perhatian dan kerja sama yang baik diucapkan terima kasih.

a.n. Dekan  
Wakil Dekan Bidang Akademik

Prof. Dr. Herbert Sipahutar, M.S., M.Sc  
NIP. 19610626198710 1 001

## Lampiran 2. Surat Selesai Penelitian



### DINAS KESEHATAN PROVINSI SUMATERA UTARA UPT. LABORATORIUM KESEHATAN DAERAH

Jl. Willem Iskandar Pasar V Barat I No. 4  
Phone. (061) 6613249 - 6613286 Fax. (061) 6617079 Ext. 33  
Medan 20371

## SURAT KETERANGAN

Nomor : 440.445.01.1/ 148 /VII/2017

Yang bertanda tangan dibawah ini, Kepala UPT. Laboratorium Kesehatan Daerah Dinas Kesehatan Provinsi Sumatera Utara, menerangkan bahwa :

Nama : Rr Shofiyah Nur Rahmah  
NIM : 4133220033  
Program Studi : S1 - Biologi  
FMIPA Universitas Negeri Medan

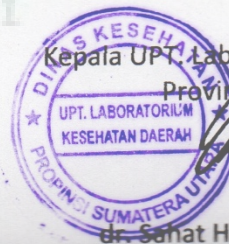
Sesuai dengan Surat Permohonan Penelitian No. 1207/UN33.4.1/LT/2017 tanggal 26 Mei 2017, telah selesai melaksanakan Penelitian di Laboratorium Kesehatan Daerah Provinsi Sumatera Utara dari tanggal 05 s/d 16 Juni 2017, dalam rangka penyusunan skripsinya yang berjudul :

“ PENGARUH LAMA PENYIMPANAN DAGING AYAM PADA SUHU RUANG TERHADAP ANGKA LEMPENG TOTAL BAKTERI DAN PEMERIKSAAN ADANYA BAKTERI SALMONELLA SP ”

Demikian Surat Keterangan ini dibuat dengan sebenarnya, untuk dapat dipergunakan seperlunya.

Medan, 03 Juli 2017

Kepala UPT. Laboratorium Kesehatan Daerah  
Provinsi Sumatera Utara,

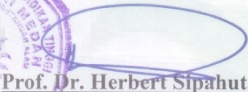
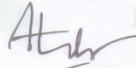
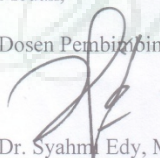


dr. Sehat Hasiholan Pasaribu, M.Kes  
Pembina

NIP. 19631123 199903 1 002



### Lampiran 3. Surat Keterangan Dosen Pembimbing Skripsi

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p>KEMENTERIAN RISET, TEKNOLOGI, DAN PENDIDIKAN TINGGI<br/>UNIVERSITAS NEGERI MEDAN<br/>FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM<br/>JURUSAN BIOLOGI<br/>PROGRAM STUDI : PENDIDIKAN BIOLOGI (S1) &amp; BIOLOGI (S1)<br/>Jl. Willem Iskandar Pasar V Medan Estate Medan 20221 Phone: 081370413188</p> |
| <div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <p>Kepada : Yth, Dr. Syahmi Edi, M.Si<br/>Dosen Jurusan Biologi FMIPA Unimed<br/>di<br/>Medan</p> <p>Dengan hormat, kami mohon kesediaan Saudari untuk menjadi Dosen Pembimbing dalam penyusunan Skripsi atas nama Mahasiswa :</p> <p>Nama : Rr Sophia<br/>NIM : 4133220033<br/>Program Studi : Biologi</p> <p>Sebagai salah satu persyaratan untuk memperoleh gelar sesuai dengan program studinya.</p> <p>Demikian kami sampaikan, atas kerja sama yang baik kami ucapkan terima kasih.</p> <p>Mengetahui,<br/>An. Dekan<br/>Wakil Dekan Bidang Akademik,</p> <p style="text-align: center;"><br/><b>Prof. Dr. Herbert Sipahutar, MS., M.Sc.</b><br/>NIP. 196106261987101001</p> </div> <div style="width: 35%; text-align: right;"> <p>No. 0013/UN33.4.8/KM/2016</p> <p>Medan, 25 Oktober 2016<br/>Ketua Jurusan,</p> <p style="text-align: center;"><br/><b>Dr. Hasruddin, M.Pd</b><br/>NIP. 196404241989031027</p> </div> </div> |                                                                                                                                                                                                                                                                                                           |
| <p><b><u>SURAT PERSETUJUAN</u></b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                           |
| <p>Mahasiswa yang tersebut di bawah ini:</p> <p>Nama : Rr Sophia<br/>NIM : 4133220033<br/>Program Studi : Biologi</p> <p>Dapat saya setuju untuk saya bimbing penyusunan skripsinya dalam rangka memenuhi salah satu persyaratan untuk memperoleh gelar sesuai dengan program studinya.</p> <div style="display: flex; justify-content: space-between; align-items: flex-end; padding-top: 20px;"> <div style="width: 45%;"> <p>Medan,</p> <p>Dosen Pembimbing Skripsi,</p> <p style="text-align: center;"><br/><b>Dr. Syahmi Edi, M.Si.</b><br/>NIP. 196407101990031002</p> </div> <div style="width: 50%; text-align: center;"> <p><i>Character Building</i><br/>UNIVERSITY</p> </div> </div>                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                           |
| <p><i>Dibuat rangkap 4 (empat) :</i><br/>1. Untuk Fakultas</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                           |

#### Lampiran 4. Hasil Perhitungan ALTB

##### Hasil Perhitungan Kontaminasi Bakteri pada Suhu Ruang

| Perlakuan | Ulangan |     |     |     |     | Total | Rata-Rata |
|-----------|---------|-----|-----|-----|-----|-------|-----------|
|           | I       | II  | III | IV  | V   |       |           |
| R0        | 12      | 16  | 4   | 7   | 23  | 62    | 12,4      |
| R1        | 51      | 49  | 65  | 44  | 36  | 245   | 49        |
| R2        | 114     | 53  | 76  | 68  | 92  | 403   | 80,6      |
| R3        | 153     | 116 | 217 | 172 | 209 | 867   | 173,4     |
| R4        | 316     | 292 | 381 | 394 | 387 | 1770  | 354       |

##### Tabel Sidik Ragam Sampel Daging Ayam pada Suhu Ruang

| SK        | db | JK        | KT       | F Hitung |    | Ftabel |       |
|-----------|----|-----------|----------|----------|----|--------|-------|
|           |    |           |          |          |    | 0,05   | 0,01  |
| Perlakuan | 4  | 374077,04 | 93519,26 | 101,356  | ** | 2,866  | 4,430 |
| Galat     | 20 | 18453,60  | 922,68   |          |    |        |       |
| Total     | 24 | 392530,64 |          |          |    |        |       |

##### Hasil Perhitungan Kontaminasi Bakteri pada Suhu Refrigerator

| Perlakuan | Ulangan |    |     |    |    | Total | Rata-Rata |
|-----------|---------|----|-----|----|----|-------|-----------|
|           | I       | II | III | IV | V  |       |           |
| K0        | 14      | 19 | 11  | 8  | 20 | 72    | 14,4      |
| K1        | 7       | 25 | 23  | 11 | 13 | 79    | 15,8      |
| K2        | 14      | 35 | 38  | 23 | 27 | 137   | 27,4      |
| K3        | 42      | 26 | 50  | 39 | 31 | 188   | 37,6      |
| K4        | 54      | 51 | 47  | 49 | 57 | 258   | 51,6      |

##### Tabel Sidik Ragam Sampel Daging Ayam pada Suhu Refrigerator

| SK        | db | JK      | KT      | F Hitung |    | Ftabel |       |
|-----------|----|---------|---------|----------|----|--------|-------|
|           |    |         |         |          |    | 0,05   | 0,01  |
| Perlakuan | 4  | 4870,16 | 1217,54 | 21,443   | ** | 2,866  | 4,430 |
| Galat     | 20 | 1135,60 | 56,78   |          |    |        |       |
| Total     | 24 | 6005,76 |         |          |    |        |       |



## Lampiran 5. Hasil Olah Data SPSS

### SUHU RUANG

#### Oneway

##### Descriptives

ALTB\_Ruang

|       | N  | Mean     | Std. Deviation | Std. Error | 95% Confidence Interval for Mean |             | Minimum | Maximum |
|-------|----|----------|----------------|------------|----------------------------------|-------------|---------|---------|
|       |    |          |                |            | Lower Bound                      | Upper Bound |         |         |
| R0    | 5  | 12.4000  | 7.50333        | 3.35559    | 3.0834                           | 21.7166     | 4.00    | 23.00   |
| R1    | 5  | 49.0000  | 10.65364       | 4.76445    | 35.7718                          | 62.2282     | 36.00   | 65.00   |
| R2    | 5  | 80.6000  | 23.38376       | 10.45753   | 51.5652                          | 109.6348    | 53.00   | 114.00  |
| R3    | 5  | 1.7340E2 | 41.47650       | 18.54885   | 121.9001                         | 224.8999    | 116.00  | 217.00  |
| R4    | 5  | 3.5400E2 | 46.65297       | 20.86384   | 296.0727                         | 411.9273    | 292.00  | 394.00  |
| Total | 25 | 1.3388E2 | 127.88840      | 25.57768   | 81.0903                          | 186.6697    | 4.00    | 394.00  |

##### ANOVA

| ALTB_Ruang     |                |    |             |         |      |
|----------------|----------------|----|-------------|---------|------|
|                | Sum of Squares | df | Mean Square | F       | Sig. |
| Between Groups | 374077.040     | 4  | 93519.260   | 101.356 | .000 |
| Within Groups  | 18453.600      | 20 | 922.680     |         |      |
| Total          | 392530.640     | 24 |             |         |      |

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## Univariate Analysis of Variance

Between-Subjects Factors

|                   |    | Value Label | N |
|-------------------|----|-------------|---|
| Lama_Simpan_Ruang | 0  | R0          | 5 |
|                   | 3  | R1          | 5 |
|                   | 6  | R2          | 5 |
|                   | 9  | R3          | 5 |
|                   | 12 | R4          | 5 |

Tests of Between-Subjects Effects

Dependent Variable:ALTB\_Ruang

| Source            | Type III Sum of Squares | df | Mean Square | F       | Sig. |
|-------------------|-------------------------|----|-------------|---------|------|
| Corrected Model   | 374077.040 <sup>a</sup> | 4  | 93519.260   | 101.356 | .000 |
| Intercept         | 448096.360              | 1  | 448096.360  | 485.647 | .000 |
| Lama_Simpan_Ruang | 374077.040              | 4  | 93519.260   | 101.356 | .000 |
| Error             | 18453.600               | 20 | 922.680     |         |      |
| Total             | 840627.000              | 25 |             |         |      |
| Corrected Total   | 392530.640              | 24 |             |         |      |

a. R Squared = ,953 (Adjusted R Squared = ,944)

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## Post Hoc Tests

### Lama\_Simpan\_Ruang

#### Multiple Comparisons

ALTB\_Ruang

LSD

| (I) | (J) | Mean Difference<br>(I-J) | Std. Error | Sig. | 95% Confidence Interval |             |
|-----|-----|--------------------------|------------|------|-------------------------|-------------|
|     |     |                          |            |      | Lower Bound             | Upper Bound |
| R0  | R1  | -36.6000                 | 19.21125   | .071 | -76.6740                | 3.4740      |
|     | R2  | -68.2000*                | 19.21125   | .002 | -108.2740               | -28.1260    |
|     | R3  | -161.0000*               | 19.21125   | .000 | -201.0740               | -120.9260   |
|     | R4  | -341.6000*               | 19.21125   | .000 | -381.6740               | -301.5260   |
| R1  | R0  | 36.6000                  | 19.21125   | .071 | -3.4740                 | 76.6740     |
|     | R2  | -31.6000                 | 19.21125   | .116 | -71.6740                | 8.4740      |
|     | R3  | -124.4000*               | 19.21125   | .000 | -164.4740               | -84.3260    |
|     | R4  | -305.0000*               | 19.21125   | .000 | -345.0740               | -264.9260   |
| R2  | R0  | 68.2000*                 | 19.21125   | .002 | 28.1260                 | 108.2740    |
|     | R1  | 31.6000                  | 19.21125   | .116 | -8.4740                 | 71.6740     |
|     | R3  | -92.8000*                | 19.21125   | .000 | -132.8740               | -52.7260    |
|     | R4  | -273.4000*               | 19.21125   | .000 | -313.4740               | -233.3260   |
| R3  | R0  | 161.0000*                | 19.21125   | .000 | 120.9260                | 201.0740    |
|     | R1  | 124.4000*                | 19.21125   | .000 | 84.3260                 | 164.4740    |
|     | R2  | 92.8000*                 | 19.21125   | .000 | 52.7260                 | 132.8740    |
|     | R4  | -180.6000*               | 19.21125   | .000 | -220.6740               | -140.5260   |
| R4  | R0  | 341.6000*                | 19.21125   | .000 | 301.5260                | 381.6740    |
|     | R1  | 305.0000*                | 19.21125   | .000 | 264.9260                | 345.0740    |
|     | R2  | 273.4000*                | 19.21125   | .000 | 233.3260                | 313.4740    |
|     | R3  | 180.6000*                | 19.21125   | .000 | 140.5260                | 220.6740    |

Based on observed means.

The error term is Mean Square(Error) = 922,680.

\*. The mean difference is significant at the ,05 level.

## SUHU REFRIGERATOR

### Oneway

#### Descriptives

ALTB\_Refrigerator

|       |  | N  | Mean    | Std. Deviation | Std. Error | 95% Confidence Interval for Mean |             | Minimum | Maximum |
|-------|--|----|---------|----------------|------------|----------------------------------|-------------|---------|---------|
|       |  |    |         |                |            | Lower Bound                      | Upper Bound |         |         |
| K0    |  | 5  | 14.4000 | 5.12835        | 2.29347    | 8.0323                           | 20.7677     | 8.00    | 20.00   |
| K1    |  | 5  | 15.8000 | 7.82304        | 3.49857    | 6.0864                           | 25.5136     | 7.00    | 25.00   |
| K2    |  | 5  | 27.4000 | 9.60729        | 4.29651    | 15.4710                          | 39.3290     | 14.00   | 38.00   |
| K3    |  | 5  | 37.6000 | 9.39681        | 4.20238    | 25.9323                          | 49.2677     | 26.00   | 50.00   |
| K4    |  | 5  | 51.6000 | 3.97492        | 1.77764    | 46.6645                          | 56.5355     | 47.00   | 57.00   |
| Total |  | 25 | 29.3600 | 15.81898       | 3.16380    | 22.8302                          | 35.8898     | 7.00    | 57.00   |

#### ANOVA

ALTB\_Refrigerator

|                | Sum of Squares | df | Mean Square | F      | Sig. |
|----------------|----------------|----|-------------|--------|------|
| Between Groups | 4870.160       | 4  | 1217.540    | 21.443 | .000 |
| Within Groups  | 1135.600       | 20 | 56.780      |        |      |
| Total          | 6005.760       | 24 |             |        |      |

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## Univariate Analysis of Variance

Between-Subjects Factors

|                          |    | Value Label | N |
|--------------------------|----|-------------|---|
| Lama_Simpan_Refrigerator | 0  | K0          | 5 |
|                          | 3  | K1          | 5 |
|                          | 6  | K2          | 5 |
|                          | 9  | K3          | 5 |
|                          | 12 | K4          | 5 |

Tests of Between-Subjects Effects

Dependent Variable: ALTB\_Refrigerator

| Source                   | Type III Sum of Squares | df | Mean Square | F       | Sig. |
|--------------------------|-------------------------|----|-------------|---------|------|
| Corrected Model          | 4870.160 <sup>a</sup>   | 4  | 1217.540    | 21.443  | .000 |
| Intercept                | 21550.240               | 1  | 21550.240   | 379.539 | .000 |
| Lama_Simpan_Refrigerator | 4870.160                | 4  | 1217.540    | 21.443  | .000 |
| Error                    | 1135.600                | 20 | 56.780      |         |      |
| Total                    | 27556.000               | 25 |             |         |      |
| Corrected Total          | 6005.760                | 24 |             |         |      |

a. R Squared = ,811 (Adjusted R Squared = ,773)

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## Post Hoc Tests

### Lama\_Simpan\_Refrigerator

#### Multiple Comparisons

ALTB\_Refrigerator

LSD

| (I)                            | (J)                            | Mean Difference<br>(I-J) | Std. Error | Sig. | 95% Confidence Interval |             |
|--------------------------------|--------------------------------|--------------------------|------------|------|-------------------------|-------------|
|                                |                                |                          |            |      | Lower Bound             | Upper Bound |
| K0<br>Lama_Simpan_Refrigerator | K1<br>Lama_Simpan_Refrigerator | -1.4000                  | 4.76571    | .772 | -11.3411                | 8.5411      |
|                                | K2                             | -13.0000*                | 4.76571    | .013 | -22.9411                | -3.0589     |
|                                | K3                             | -23.2000*                | 4.76571    | .000 | -33.1411                | -13.2589    |
|                                | K4                             | -37.2000*                | 4.76571    | .000 | -47.1411                | -27.2589    |
| K1                             | K0                             | 1.4000                   | 4.76571    | .772 | -8.5411                 | 11.3411     |
|                                | K2                             | -11.6000*                | 4.76571    | .024 | -21.5411                | -1.6589     |
|                                | K3                             | -21.8000*                | 4.76571    | .000 | -31.7411                | -11.8589    |
|                                | K4                             | -35.8000*                | 4.76571    | .000 | -45.7411                | -25.8589    |
| K2                             | K0                             | 13.0000*                 | 4.76571    | .013 | 3.0589                  | 22.9411     |
|                                | K1                             | 11.6000*                 | 4.76571    | .024 | 1.6589                  | 21.5411     |
|                                | K3                             | -10.2000*                | 4.76571    | .045 | -20.1411                | -.2589      |
|                                | K4                             | -24.2000*                | 4.76571    | .000 | -34.1411                | -14.2589    |
| K3                             | K0                             | 23.2000*                 | 4.76571    | .000 | 13.2589                 | 33.1411     |
|                                | K1                             | 21.8000*                 | 4.76571    | .000 | 11.8589                 | 31.7411     |
|                                | K2                             | 10.2000*                 | 4.76571    | .045 | .2589                   | 20.1411     |
|                                | K4                             | -14.0000*                | 4.76571    | .008 | -23.9411                | -4.0589     |
| K4                             | K0                             | 37.2000*                 | 4.76571    | .000 | 27.2589                 | 47.1411     |
|                                | K1                             | 35.8000*                 | 4.76571    | .000 | 25.8589                 | 45.7411     |
|                                | K2                             | 24.2000*                 | 4.76571    | .000 | 14.2589                 | 34.1411     |
|                                | K3                             | 14.0000*                 | 4.76571    | .008 | 4.0589                  | 23.9411     |

Based on observed means.

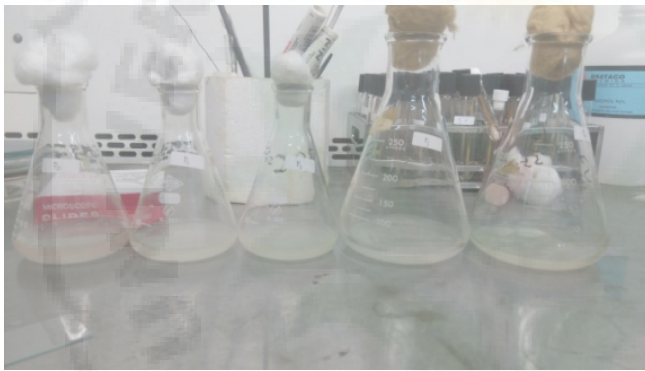
The error term is Mean Square(Error) = 56,780.

\*. The mean difference is significant at the ,05 level.

## Lampiran 6. Dokumentasi Kegiatan



Gambar 1. Sampel daging ayam



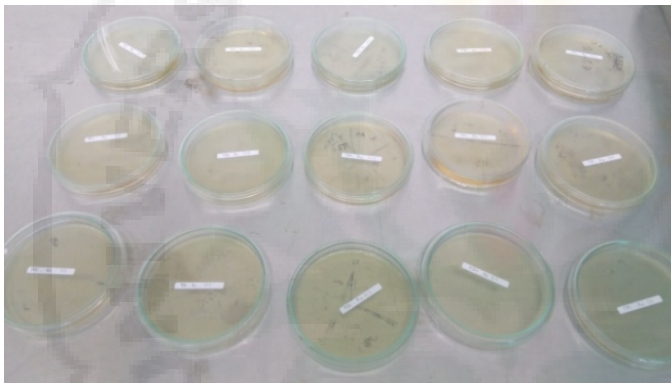
Gambar 2. Sampel setelah homogenisasi



Gambar 3. Peneliti melakukan pengenceran



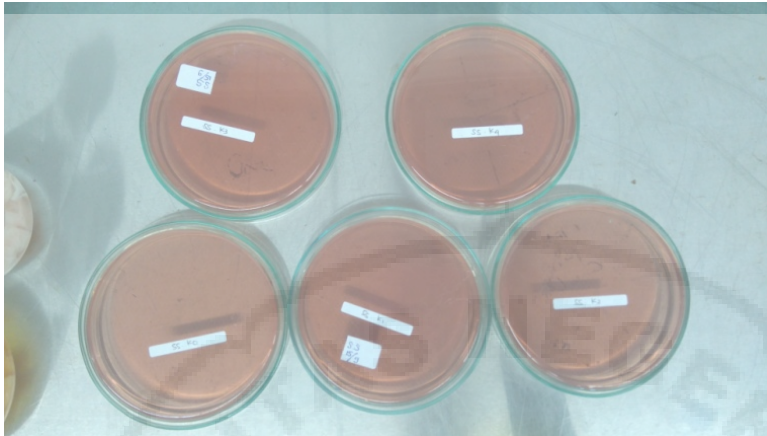
Gambar 4. Pengenceran sampel



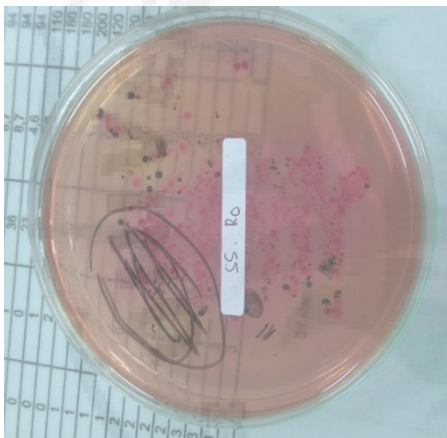
Gambar 5. Media tanam NA (Nutrient Agar)



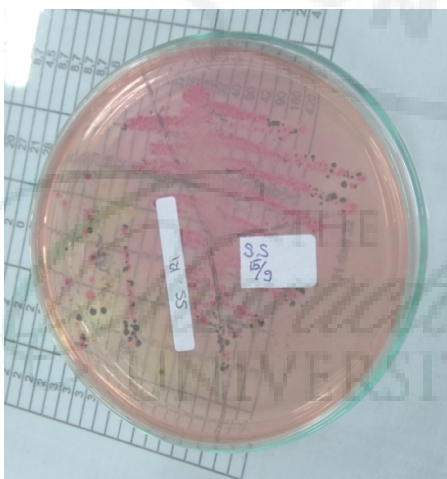
Gambar 6. Peneliti menghitung bakteri yang tumbuh



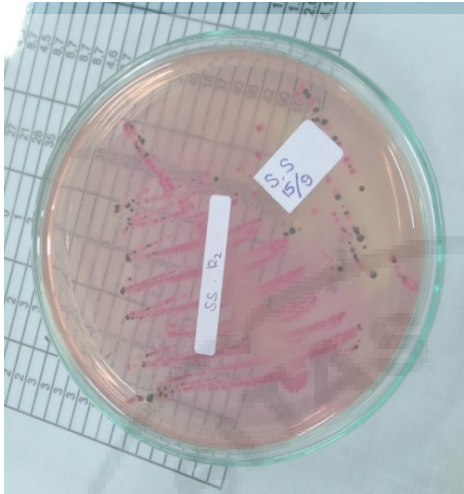
Gambar 7. Media tanam Salmonella Shigella Agar (SSA)



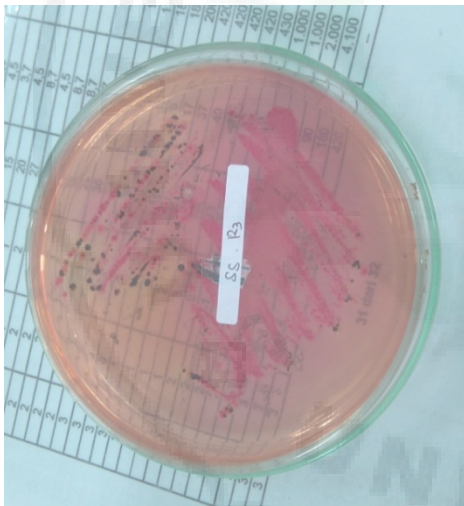
Gambar 8. Hasil dari sampel R0



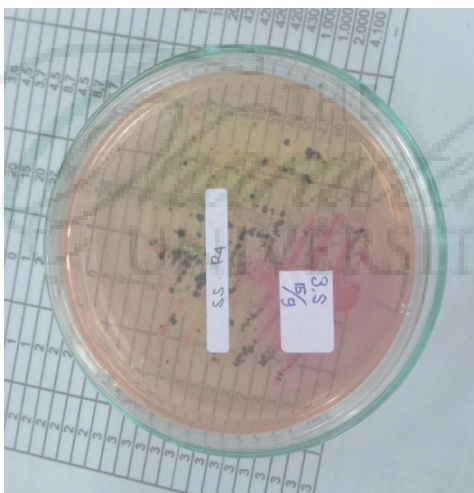
Gambar 9. Hasil dari sampel R1



Gambar 10. Hasil dari sampel R2

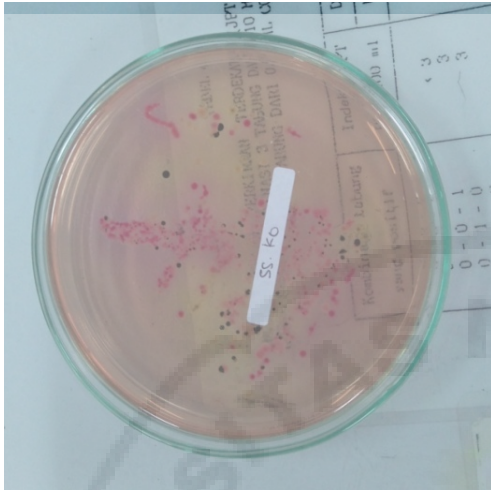


Gambar 11. Hasil dari sampel R3

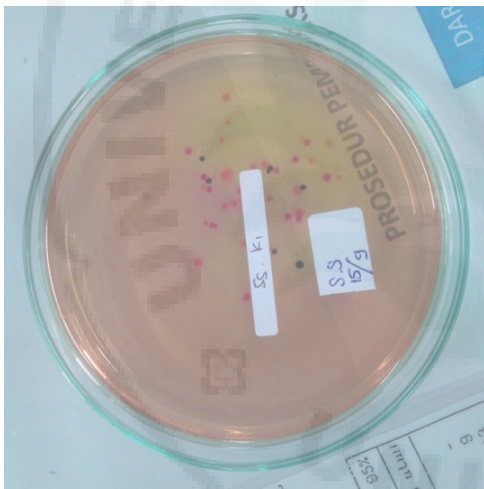


Gambar 12. Hasil dari sampel R4





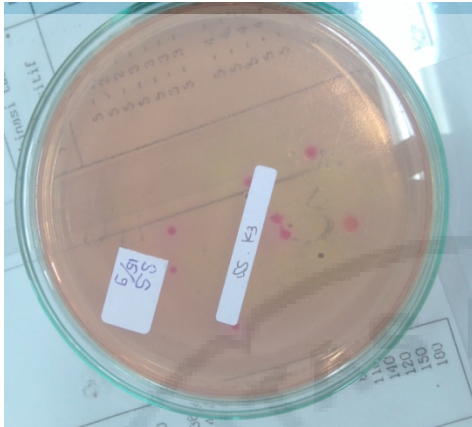
Gambar 13. Hasil dari sampel K0



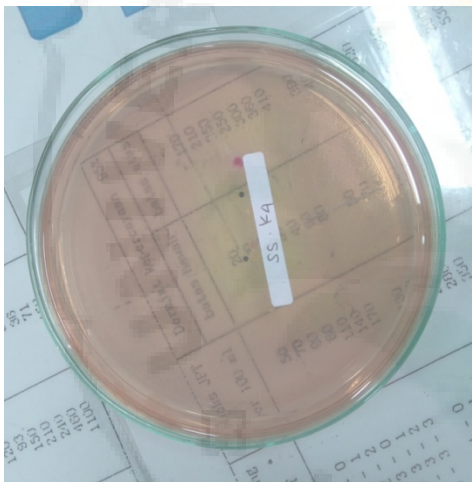
Gambar 14. Hasil dari sampel K1



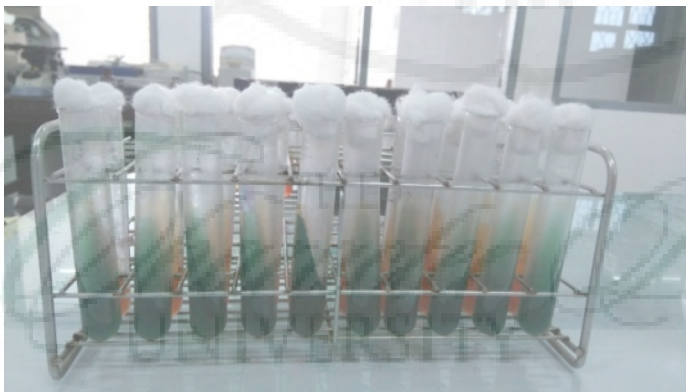
Gambar 15. Hasil dari sampel K2



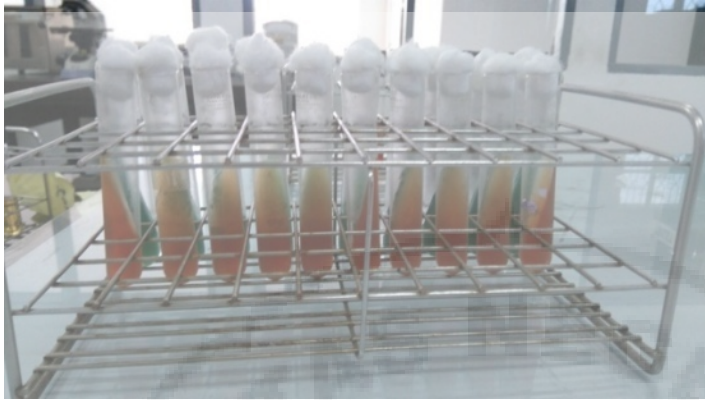
Gambar 16. Hasil dari sampel K3



Gambar 17. Hasil dari sampel K4



Gambar 18. Media SCA



Gambar 19. Media TSIA



Gambar 20. Peneliti menanam sampel pada media selektif



Gambar 21. Peneliti melihat hasil

## RIWAYAT HIDUP

Penulis dilahirkan di Medan pada tanggal 1 Februari 1995. Ibu bernama Sulastri, Ayah bernama Edhy Mirwandhono, dan merupakan anak ketiga dari lima bersaudara. Pada tahun 2000, penulis masuk SD Dharma Wanita Medan, dan lulus pada tahun 2006. Pada tahun 2006, penulis melanjutkan sekolah SMP Dharma Pancasila Medan, dan lulus pada tahun 2009. Pada tahun 2009, penulis melanjutkan sekolah di SMA Negeri 3 Medan, dan lulus pada tahun 2012. Pada tahun 2013, penulis diterima di Program Studi Biologi, Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Negeri Medan. Selama kuliah, penulis aktif di organisasi Himpunan Mahasiswa Jurusan Biologi Universitas Negeri Medan.

