LAMPIRAN

LAMPIRAN

Lampiran 1. Jadwal pengambilan sampel dan pengujian kadar air, pH, Aw, dan warna (Juli 2009)

Tanggal	14	15	16	22	23	24	25
Pengujian kadar air							
Identifikasi warna							
Perubahan Aw							
Identifikasi pH							

Keterangan :

: Uji pendahuluan
: Uji inti

Lampiran 2. Pengambilan sampel dan pengujian identifikasi mikroorganisme

Tanggal	7	8	9	27	28	29
Pengambilan sampel						
Inkubasi 24 jam pada media HIB dan Selenit broth						
Pemindahan pada media selektif dan inkubasi 24 jam						
Pengecatan gram dan pengamatan mikroskop						
Homogenisasi dengan NaCl 0,85%						
Pembiakan pada media NA						
Inkubasi 24 jam						
Pengamatan TPC						

Keterangan :

: Uji pendahuluan
: Uji inti

Lampiran 3. Hasil Pengukuran pH, Aw, kadar air dan warna pada sampel

Pengukuran pH, Aw, kadar air dan warna jam ke 0 pada sampel daging sapi segar

Kode	pH	Aw	Kadar air	Warna		
				L	a	b
AO1	5.83	0.967	78.126	37.07	14.31	2.49
AO2	5.84	0.978	78.029	37.37	14.43	2.63
BO1	5.78	0.981	66.241	38.09	14.73	3.31
BO2	5.66	0.988	70.014	39.44	13.44	2.74
CO1	5.91	0.966	19.827	38.69	18.87	3.93
CO2	5.88	0.977	30.808	37.25	18.48	3.4
DO1	5.9	0.967	76.797	36.72	16.26	3.44
DO2	5.77	0.998	76.578	37.81	18.25	3.72
EO1	6.01	0.971	80.749	39.72	14.24	1.99
EO2	6.22	0.955	79.747	38.84	15.23	2.01
Rata-rata =	5.88	0.9748	65.692	38.1	15.824	2.966

Pengukuran pH, Aw, kadar air dan warna jam ke 2 pada sampel daging sapi segar

Kode	pH	Aw	Kadar air	Warna		
				L	a	b
AO1	6.12	0.993	79.398	37.07	14.31	2.49
AO2	6.23	0.982	79.889	37.37	14.43	2.63
BO1	5.9	0.976	69.809	38.09	14.73	3.31
BO2	5.85	0.988	72.387	39.44	13.44	2.74
CO1	6.08	0.982	78.568	38.69	18.87	3.93
CO2	6.22	0.991	79.352	37.25	18.48	3.4
DO1	6	0.976	76.188	36.72	16.26	3.44
DO2	6.11	0.989	81.532	37.81	18.25	3.72
EO1	6.12	0.987	80.018	39.72	14.24	1.99
EO2	6.22	0.989	80.793	38.84	15.23	2.01
Rata-rata =	6.085	0.9853	77.793	38.1	15.824	2.966

Pengukuran pH, Aw, kadar air dan warna jam ke 4 pada sampel daging sapi segar

Kode	pH	Aw	Kadar air	Warna		
				L	a	b
AO1	5.81	0.967	78.755	37.07	14.31	2.49
AO2	5.85	0.989	79.016	37.37	14.43	2.63
BO1	5.91	0.981	69.830	38.09	14.73	3.31
BO2	5.99	0.956	71.080	39.44	13.44	2.74
CO1	6.05	0.973	79.231	38.69	18.87	3.93
CO2	6.12	0.982	78.323	37.25	18.48	3.4
DO1	5.9	0.966	75.591	36.72	16.26	3.44
DO2	5.91	0.977	75.752	37.81	18.25	3.72
EO1	6.02	0.971	78.290	39.72	14.24	1.99
EO2	6.13	0.989	79.897	38.84	15.23	2.01
Rata-rata =	5.969	0.9751	76.576	38.1	15.824	2.966

Pengukuran pH, Aw, kadar air dan warna jam ke 6 pada sampel daging sapi segar

Kode	pH	Aw	Kadar air	Warna		
				L	a	b
AO1	6.14	0.996	73.264	33.44	13.54	1.19
AO2	6.03	0.998	70.682	33.54	13.05	1.5
BO1	5.97	0.988	74.965	39.37	15.5	2.46
BO2	5.85	0.978	74.031	39.98	12.95	1.86
CO1	6.36	0.984	76.614	37.08	15.56	1.68
CO2	6.55	0.973	78.183	36.07	15.41	1.44
DO1	6.13	0.984	78.181	36.25	14.66	2.07
DO2	6.22	0.951	77.654	37.81	13.63	1.38
EO1	6.31	0.987	78.773	34.15	15.85	1.15
EO2	6.76	0.933	78.935	34.75	16.08	1.51
Rata-rata =	6.232	0.9772	76.128	36.244	14.623	1.624

Pengukuran pH, Aw, kadar air dan warna jam ke 8 pada sampel daging sapi segar

Kode	pH	Aw	Kadar air	Warna		
				L	a	b
AO1	6.23	0.955	75.599	33.17	15.47	1.65
AO2	6.05	0.952	75.629	32.38	15.51	1.6
BO1	5.99	0.965	75.502	35.36	15.84	3.35
BO2	6.88	0.922	72.630	35.41	15.69	2.9
CO1	5.89	0.976	95.194	39.71	16.25	2.97
CO2	5.46	0.911	76.721	39.93	16.34	3.18
DO1	6.29	0.962	76.380	36.71	13.88	1.62
DO2	6.01	0.983	75.718	37.36	14.29	2.02
EO1	6.13	0.978	80.078	32.25	16.28	1.71
EO2	6.55	0.991	178.680	33.76	15.56	1.86
Rata-rata =	6.148	0.9595	88.213	35.604	15.511	2.286

Lampiran 4. Hasil pengukuran TPC pada daging sapi segar

Dalam perhitungan koloni bakteri ada beberapa hal yang perlu diperhatikan meliputi :

- Hasil yang dilaporkan terdiri dari 2 angka

  Contoh : 2 dan 2 10^4
- Bila semua pengenceran < 30, dipakai koloni dari pengenceran terkecil.
- Bila semua pengenceran > 300, dipakai koloni dari pengenceran terbesar.
- Bila dari 2 tingkat pengenceran, ada 2 nilai yang termasuk dalam kisaran 30-300 koloni, maka dibuat perbandingan sebagai berikut

  Contoh: $\frac{239}{41}$

Angka pengenceran terbesar, dibagi dengan angka pengenceran terkecil. Bila hasilnya ≤ 2, jumlah yang dipakai adalah rata-rata keduanya. Namun bila hasilnya ≥ 2, data yang dipakai adalah koloni dari pengenceran terkecil.

Total bakteri : Total koloni x faktor pengenceran (CFU/ml)

Pengukuran TPC pada daging sapi segar

Kode	TPC (CFU/ml)				
	Jam 0	Jam 2	Jam 4	Jam 6	Jam 8
1	888000	280000	20000	848000	704000
2	340000	1200000	12000000	184000	464000
3	540000	727000	10200000	308000	360000
4	340000	60000	5040000	236000	380000
5	756000	1150000	6280000	30000	420000
	4.1907E+28	1.68548E+28	7.74821E+31	3.4025E+26	1.87683E+28
Xg	**530221.4231**	**441920.9147**	**2386933.495**	**202469.4625**	**451528.5393**

Keterangan : 1 = pedagang 1 5 = pedagang 5
2 = pedagang 2
3 = pedagang 3
4 = pedagang 4

Lampiran 5. Analisa Statistika

Tests of Normality

	waktu	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
pH	0	.222	10	.178	.922	10	.372
	2	.185	10	.200*	.898	10	.208
	4	.204	10	.200*	.943	10	.584
	6	.131	10	.200*	.967	10	.861
	8	.155	10	.200*	.962	10	.813
Kadarair	0	.310	10	.007	.691	10	.001
	2	.280	10	.026	.822	10	.027
	4	.286	10	.020	.815	10	.022
	6	.209	10	.200*	.892	10	.179
	8	.399	10	.000	.496	10	.000
Aw	0	.138	10	.200*	.971	10	.902
	2	.212	10	.200*	.901	10	.224
	4	.112	10	.200*	.961	10	.794
	6	.230	10	.141	.849	10	.056
	8	.186	10	.200*	.914	10	.309
L	0	.262	10	.050	.724	10	.002
	2	.160	10	.200*	.945	10	.608
	4	.226	10	.160	.832	10	.035
	6	.140	10	.200*	.935	10	.498
	8	.144	10	.200*	.920	10	.359
a	0	.290	10	.017	.852	10	.062
	2	.216	10	.200*	.862	10	.080
	4	.153	10	.200*	.936	10	.505
	6	.241	10	.103	.872	10	.106
	8	.280	10	.025	.849	10	.056
b	0	.160	10	.200*	.916	10	.326
	2	.191	10	.200*	.930	10	.448
	4	.278	10	.027	.807	10	.017
	6	.210	10	.200*	.924	10	.390
	8	.244	10	.094	.815	10	.022

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
pH	0	10	5.8800	.15217	.04812	5.7711	5.9889	5.66	6.22
	2	10	6.0850	.13218	.04180	5.9904	6.1796	5.85	6.23
	4	10	5.9690	.11030	.03488	5.8901	6.0479	5.81	6.13
	6	10	6.2320	.27422	.08672	6.0358	6.4282	5.85	6.76
	8	10	6.1480	.38270	.12102	5.8742	6.4218	5.46	6.88
	Total	50	6.0628	.25778	.03646	5.9895	6.1361	5.46	6.88
Kadarair	0	10	65.6921	21.88953	6.92208	50.0333	81.3509	19.83	80.75
	2	10	77.7937	3.85082	1.21774	75.0390	80.5484	69.81	81.53
	4	10	76.5769	3.52991	1.11626	74.0518	79.1021	69.83	79.90
	6	10	76.1287	2.77878	.87873	74.1409	78.1165	70.68	78.94
	8	10	88.2135	32.40250	10.24657	65.0341	111.3928	72.63	178.68
	Total	50	76.8810	18.42128	2.60516	71.6457	82.1162	19.83	178.68
Aw	0	10	.9748	.01235	.00390	.9660	.9836	.96	1.00
	2	10	.9853	.00600	.00190	.9810	.9896	.98	.99
	4	10	.9751	.01058	.00334	.9675	.9827	.96	.99
	6	10	.9772	.02041	.00645	.9626	.9918	.93	1.00
	8	10	.9595	.02589	.00819	.9410	.9780	.91	.99
	Total	50	.9744	.01806	.00255	.9692	.9795	.91	1.00
L	0	10	36.4710	4.03130	1.27481	33.5872	39.3548	25.87	39.92
	2	10	38.1000	1.03390	.32695	37.3604	38.8396	36.72	39.72
	4	10	37.6950	1.60826	.50858	36.5445	38.8455	34.49	39.19
	6	10	36.2440	2.32623	.73562	34.5799	37.9081	33.44	39.98
	8	10	35.6040	2.80764	.88785	33.5955	37.6125	32.25	39.93
	Total	50	36.8228	2.64255	.37371	36.0718	37.5738	25.87	39.98
a	0	10	15.8230	.97814	.30931	15.1233	16.5227	14.75	17.54
	2	10	15.8240	2.01068	.63583	14.3856	17.2624	13.44	18.87
	4	10	15.2610	1.67557	.52986	14.0624	16.4596	12.89	17.72
	6	10	14.6230	1.21694	.38483	13.7525	15.4935	12.95	16.08
	8	10	15.5110	.82463	.26077	14.9211	16.1009	13.88	16.34
	Total	50	15.4084	1.42607	.20168	15.0031	15.8137	12.89	18.87
b	0	10	2.7500	.39345	.12442	2.4685	3.0315	2.31	3.61
	2	10	2.9660	.69011	.21823	2.4723	3.4597	1.99	3.93
	4	10	2.6930	.93628	.29608	2.0232	3.3628	1.69	3.96
	6	10	1.6240	.40708	.12873	1.3328	1.9152	1.15	2.46
	8	10	2.2860	.72102	.22801	1.7702	2.8018	1.60	3.35
	Total	50	2.4638	.79507	.11244	2.2378	2.6898	1.15	3.96

Post Hoc Tests

Homogeneous Subsets

pH

Duncan[a]

waktu	N	Subset for alpha = .05		
		1	2	3
0	10	5.8800		
4	10	5.9690	5.9690	
2	10	6.0850	6.0850	6.0850
8	10		6.1480	6.1480
6	10			6.2320
Sig.		.070	.113	.193

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 10.000.

Kadarair

Duncan[a]

waktu	N	Subset for alpha = .05	
		1	2
0	10	65.6921	
6	10	76.1287	76.1287
4	10	76.5769	76.5769
2	10	77.7937	77.7937
8	10		88.2135
Sig.		.170	.171

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 10.000.

Aw

Duncan[a]

waktu	N	Subset for alpha = .05	
		1	2
8	10	.9595	
0	10	.9748	.9748
4	10	.9751	.9751
6	10		.9772
2	10		.9853
Sig.		.053	.206

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 10.000.

L

Duncan[a]

waktu	N	Subset for alpha = .05
		1
8	10	35.6040
6	10	36.2440
0	10	36.4710
4	10	37.6950
2	10	38.1000
Sig.		.058

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 10.000.

a

Duncan[a]

waktu	N	Subset for alpha = .05
		1
6	10	14.6230
4	10	15.2610
8	10	15.5110
0	10	15.8230
2	10	15.8240
Sig.		.096

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 10.000.

b

Duncan[a]

waktu	N	Subset for alpha = .05		
		1	2	3
6	10	1.6240		
8	10		2.2860	
4	10		2.6930	2.6930
0	10		2.7500	2.7500
2	10			2.9660
Sig.		1.000	.146	.391

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 10.000.

Lampiran 6. Komposisi bahan yang digunakan untuk identifikasi Mikroorganisme pada daging sapi segar

a. SIM (*Sulfur Indol Motility*) :

- Pepton from casein	20 g/l
- Pepton from meat	6,6 g/l
- Ammonium iron (II) citrate	0,2 g/l
- Sodium thiosulfate	0,2 g/l
- Agar-agar	3,0 g/l
- Distilled water	1000 ml

b. TSIA (*Triple Sugar Iron Agar*) :

- Pepton from casein	15,0 g/l
- Pepton from meat	5,0 g/l
- Meat extract	3,0 g/l
- Yeast extract	3,0 g/l
- Sodium chloride	5,0 g/l
- Lactose	10,0 g/l
- Sucrose	10,0 g/l
- D (+) glucose	1,0 g/l
- Ammonium iron (III) citrate	0,5 g/l
- Sodium thiosulfate	0,5 g/l
- Phenol red	0,024 g/l
- Agar-agar	12,0 g/l
- Distilled water	1000 ml

c. Selenite broth :

- Pepton 5 g/l
- Mannitol 4 g/l
- $Na_2HPO_4.12H_2O$ 4,3 g/l
- $NaH_2PO_4.2H_2O$ 2,8 g/l
- Water 1000 ml

d. Blood Agar :

- Difibrinated blood 50 ml
- Nutrient Agar 950 ml

e. MacConkey Agar

- Peptone 20 g
- NaCl 5 g
- Sodium taurochlate 5 g
- Agar 20 g
- Lactose 10 g
- Neutral red, 1% aq soln 10 ml
- Distilled Water 1000 ml

f. VP - MR(*Voges Poscover – Methyle Red*)

- Pepton from meat 7,0 g/l
- D (+) glucose 5,0 g/l
- Phosphate buffer 5,0 g/l
- Distilled water 1000 ml

g. Urea

- Christensen's medium

Peptone	1 g
NaCl	5 g
KH_2PO_4	2 g
Agar	20 g
Distilled water	1000 ml
Glucose	1 g
Phenol red 0.2% aq.soln	6 ml
Urea 20% aq.soln	100 ml

h. Simmon citrate

- Ammonium dihydrogen phosphate 1,0 g/l
- Di-potassium hydrogen phosphate 1,0 g/l
- Sodium citrate 2,0 g/l
- Magnesium sulfate 0,2 g/l
- Bromothymol blue 0,08 g/l
- Agar-agar 13,0 g/l
- Distilled water 1000 ml

i. *Bacillus cereus* Selective Agar

- Peptone 1,0 g/l
- Mannitol 10,0 g/l
- Sodium Clorin 2,0 g/l
- Magnesium phosphate 0,1 g/l
- Di-sodium hydrogen phosphate 2,5 g/l
- Potassium dihydrogen phosphate 0,25 g/l
- Sodium pyruvate 0,12 g/l
- pH 7,2 $\pm$ 0,2 pada 25°C

➢ Suplement *Bacillus cereus*

- Polymyxin B sulfate 50,000 IU

j. PAD (*Penil Alanin Diaminase*)

- Yeast extract 3 g/l
- Dipotassium phosphate 19 g/l
- Sodium chloride 5,0 g/l
- DL-phenylalanine 2,0 g/l
- Agar-agar 12 g/l
- Distilled water 1000 ml

k. Chromagar

Peptone 40,0 g/l

Agar 15,0 g/l

Sodium chloride 25,0 g/l

Chromogenic mix 3,5 g/l

pH: 7.0 +/- 0.2

Lampiran 7. Uji Identifikasi Mikroorganisme

a. Uji Identifikasi bakteri gram negatif

No	Jenis Bakteri	OXY	SIM			Glucose	Lactose	Maltose	Manose	sucrose	TSIA			Urea	VP	MR	S.citrat	PAD
			Motil	H_2S	Indol						Reaksi	H_2S	Gas					
1	*Salmonella*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	*Pseudomonas*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	*Escherichia coli*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

b. Uji identifikasi bakteri gram positif

Jenis bakteri	Pertumbuhan dibawah kondisi anaerobik	Katalase	Oxidase	Carbohydrate attack	VP	Arginine hydrolysis	Nitrate reduced	Lysozyme	Lysostaphin
Staphylococcus	+	+	-	F	+	+	+	r	s

Keterangan : r = Resistant
s = sensitive

Jenis bakteri	Pertumbuhan pada udara + 10% CO2	Gas dr glucose	pertumbuhan dlm 6,5% NaCL broth	Pertumbuhan pada Acetate Agar pH 5,4	pertumbuhan dalam 40% bile	sensitifitas untuk metronidazole
Streptococcus. sp	-	-	-	-	-	-

c. Uji identifikasi bakteri gram positif

Jenis bakteri	*Bacillus.sp*
Reaksi Gram	+
Ikatan dari sel	+
Motilitas	+
Panjang sel >3µm	+
Posisi dan bentuk spora	VX
Badan sel spora	-
Pertumbuhan pada 50oC	-
Pertumbuhan dalam 10% NaCl	d
Pertumbuhan anaerobik	+
Karbohidrat, asam dari ASS :	
glukosa	+
celubosa	d
galaktosa	-
manosa	-
melibiosa	-
raffinosa	-
salicin	+
xylosa	-
ONPG	-
Pemanfaatan dari citrat	d
Urea	d
Indole	-
VP	+
Pengurangan nitrat	+
Hidrolisa casein	+
Hidrolisa hippurate	-
Hidrolisa starch	+
Oksidase	d

Keterangan : V = Spora sentral / subterminal

X = Spora oval (ellipsoida)