

## Appendix 1. Questioner sheet for sensory evaluation.

### PELUNJUK PENGISIAN KUISIONER

1. Anda diminta untuk melakukan penilaian sensoris terhadap 4 sampel susu pasteurisasi yang berasal dari 4 agen yang berbeda.
2. Penilaian sensoris pada masing-masing sampel dilakukan dengan tahap-tahap sebagai berikut:
  - Menghirup aroma sampel susu dalam gelas
  - Meminum dan merasakan sampel
  - Memberikan penilaian terhadap rasa, bau dan aroma sampel.
3. Penilaian sensoris dilakukan dengan mengisi / menuliskan tanda: S, D atau P hanya pada salah satu atau beberapa kolom kriteria yang menurut Anda sesuai dengan karakteristik sampel yang bersangkutan.

#### Keterangan:

**S = Slight (sedikit);**

artinya sampel hanya memiliki sedikit rasa/aroma tersebut

**D = Definite(Agak);**

artinya sampel memiliki rasa/aroma yang agak banyak / lumayan

**P = Pronounced (Sangat tajam);**

artinya sampel memiliki rasa/aroma yang sangat tajam

4. Kolom "Total Score" tidak perlu Anda isi, karena kolom tersebut membutuhkan perhitungan yang cukup banyak.

Terimakasih untuk partisipasinya dan GOD BLESS U

# LEMBAR PENILAIAN UJI SENSORIS SUSU

**Nama:**

**Tgl:**

<b>Kode sampel</b>	127	734	317	425
<b>Total score</b>				
<b>Astringent</b>				
<b>Barny</b>				
<b>Bitter</b>				
<b>Cooked</b>				
<b>Cowy</b>				
<b>Feed</b>				
<b>Flat</b>				
<b>Foreign</b>				
<b>Fruty / fermented</b>				
<b>Garlic / onion</b>				
<b>High acid</b>				
<b>Lack freshness</b>				
<b>Malty</b>				
<b>Oxidized light</b>				
<b>Metallic oxidized</b>				
<b>Carton</b>				
<b>Rancid</b>				
<b>Salty</b>				
<b>Unclean</b>				
<b>Lainnya</b>				

## SENSORY EVALUATION OF MILK JUDGING AND GRADING MILK

The sensory judging of milk for the general purpose of quality and shelf-life evaluation is most often performed under the established guidelines of the American Dairy Science Association (ADSA). Milks are scored on a scale of 1-10 based on the lack or severity of perceived defects. Suggested guidance on scoring based on defect severity is included in this document along with a scoring form.

### Condition of the Evaluator:

**Judging Condition.** Evaluators should be in correct physical and mental condition and free from distractions (i.e. hunger). Health factors, such as colds or sinus conditions should be noted on the score sheet. Evaluators should refrain from smoking, eating or drinking beverages other than water at least one half hour before judging milks.

**Conditioning the Palate.** A defect-free milk (i.e. control) is useful for conditioning the palate before and as a reference while evaluating test samples.

### Evaluation Procedure:

**Temperature.** Milks should be tempered to 60 - 70°F (15 - 21°C) to allow the release of odors and flavors. If milk is tasted cold or too warm due to circumstances beyond your control, note this on the score sheet.

**Note Appearance.** After milk has tempered swirl the cup and observe for signs of coagulation and film formation. If coagulated or otherwise visually unacceptable, check the appropriate criticism box and put NT (not tasted) in the sample score box.

**Note Odor.** Swirling leaves a thin film, which allows volatile compounds to evaporate. Immediately after swirling milk, hold the cup up to your nose and remove the lid while inhaling. Milks with objectionable odors do not need to be tasted. Note the perceived odor in the appropriate criticism box and put NT (not tasted) in the sample score box.

**Taste the Milk.** Take a generous sip of milk – roll in the mouth – note the flavor sensation and expectorate. Do not swallow the milk. Flavors can be enhanced by drawing in a breath of fresh air through the mouth followed by a slow exhale through the nose.

**Rinse With Water Between Samples When Needed.** Rinse with water as the situation warrants. The mouth should always be rinsed after a severe defect. Unsalted crackers may be used to cleanse the palate.

**Scoring Milks:** The ADSA scoring guide and a sample score sheet are follow

**Criticisms.** Where defects are noted, mark the appropriate defect box on the score sheet with the intensity of the defect as follows:

S = Slight; D = Definite; P = Pronounce

**Flavor Score:** Use the suggested ADSA Scoring Guide to determine the overall flavor score of the milk based on the intensity of the defect. Scoring should reflect the overall acceptability of the milk as follows:

Excellent	9 - 10
Good	8 - 9
Fair - Good	7 - 8
Poor	less than 6

## The American Dairy Science Association Guide for Scoring Off-Flavors in Milk.

Flavor Criticisms	Intensity of Defect & Corresponding Score <sup>a</sup>		
	Slight	Definite	Pronounced
Acid	3	1	0
Astringent	8	7	6
Barny	5	3	1
Bitter	5	3	1
Carton/Paperboard <sup>b</sup>	9	8	6
Coagulated <sup>b</sup>	0	0	0
Cooked	9	8	6
Cowy	6	4	1
Feed	9	8	6
Fermented/Fruity	5	3	1
Flat	9	8	7
Foreign	5	3	1
Garlic/Onion	5	3	1
Lacks Freshness	8	7	6
Malty	5	3	1
Oxidized – Light	6	4	1
Oxidized – Lipid	5	3	1
Rancid	4	1	0
Salty	8	6	4
Unclean	3	1	0
Other			

Source: American Dairy Science Association, 1987 (Adapted from Bodyfelt et al, 1988. *The Sensory Evaluation of Dairy Products*, Van Nostrand Reinhold, NY).

<sup>a</sup> Normal Range is 1-10. "No Criticisms" is assigned a score of "10"

Excellent	9 - 10
Good	8 - 9
Fair - Good	7 - 8
Poor/Unacceptable	Less than 6

<sup>b</sup> Criticisms not included in original ADSA guideline.

## APPENDIX 2

### Pasteurized Milk Grading according to FDA

Types of milk	Milk Grade	Numbers of bacteria that are allowed
Pasteurized	A	< 30.000
Pasteurized	B	< 50.000
Pasteurized	C	> 50.000 (safe, only if cooked first)
Raw	Certified	< 10.000
Raw	A	< 50.000
Raw	B	< 200.000
Raw	C	< 1.000.000
Raw	D	> 1.000.000 (safe, only if cooked first)

Maximum limit of bacterial content according to SNI Indonesian standards SNI 01-6366-2000

Parameters	Raw milk	Pasteurized milk
TPC (Total Plate Count)	$1 \times 10^6$	$< 3 \times 10^4$
Coliform	$2 \times 10^1$	$< 0,1 \times 10^1$
<i>Escherichia coli</i>	negative	negative
<i>Enterococci</i>	$1 \times 10^2$	$1 \times 10^2$
<i>Staphylococcus aureus</i>	$1 \times 10^2$	$1 \times 10^1$
<i>Clostridium sp.</i>	negative	negative
<i>Salmonella sp.</i>	negative	negative
<i>Campylobacter sp.</i>	negative	negative
<i>Listeria sp</i>	negative	negative

### Appendix 3. Statistical analysis for Total Plate Count, *S.aureus* and milk composition

#### Frequencies

##### Statistics

	TPC	S_AUREUS
N	24	24
Valid		
Missing	12	12
Mean	51316.67	1196.67
Median	37350.00	1165.00
Std. Deviation	36555.23	271.82
Skewness	.428	.112
Std. Error of Skewness	.472	.472
Kurtosis	-1.327	-.845
Std. Error of Kurtosis	.918	.918
Minimum	11000	730
Maximum	121000	1680

##### Statistics

	AIR	ABU	LEMAK	PROTEIN
N	24	24	24	24
Valid				
Missing	12	12	12	12
Mean	88.982510	.747867	3.733483	3.849158
Median	88.941150	.733500	3.739650	3.867600
Std. Deviation	1.075221	7.84E-02	.943203	.598396
Skewness	1.111	.179	-.024	.447
Std. Error of Skewness	.472	.472	.472	.472
Kurtosis	2.044	-1.005	-1.247	.534
Std. Error of Kurtosis	.918	.918	.918	.918
Minimum	87.2958	.6062	2.2077	2.8598
Maximum	91.8124	.8676	5.3623	5.3623

ANOVA analysis for TPC, *S. aureus*, and milk composition for each sample.

## Oneway

### Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
TPC	12.292	3	20	.000
S_AUREUS	.959	3	20	.431

### ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
TPC	Between Groups	2.83E+10	3	9435612222	77.732	.000
	Within Groups	2.43E+09	20	121385833.3		
	Total	3.07E+10	23			
S_AUREUS	Between Groups	621366.7	3	207122.222	3.843	.025
	Within Groups	1077967	20	53898.333		
	Total	1699333	23			

## Post Hoc Tests

### Homogeneous Subsets

TPC

Duncan<sup>a</sup>

AGEN	N	Subset for alpha = .05		
		1	2	3
MATARAM TOKO	6	13683.33		
"MATARAM 734"	6	23250.00		
"Dr.Cipto"	6		70833.33	
SEBANDARAN	6			97500.00
Sig.		.148	1.000	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 6.000.

## S\_AUREUS

Duncan<sup>a</sup>

AGEN	N	Subset for alpha = .05	
		1	2
MATARAM TOKO	6	955.00	
SEBANDARAN	6	1163.33	1163.33
"Dr.Cipto"	6		1278.33
"MATARAM 734"	6		1390.00
Sig.		.136	.124

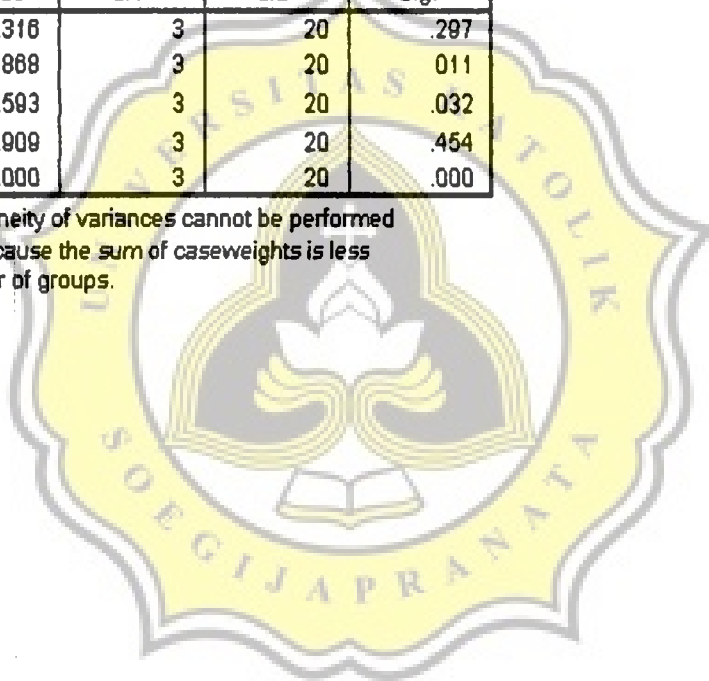
Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 6.000.

### Test of Homogeneity of Variances<sup>a</sup>

	Levene Statistic	df1	df2	Sig.
AIR	1.316	3	20	.297
ABU	4.868	3	20	.011
LEMAK	3.593	3	20	.032
PROTEIN	.909	3	20	.454
DENSITAS	40.000	3	20	.000

a. Test of homogeneity of variances cannot be performed for VISKOS because the sum of caseweights is less than the number of groups.





### ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
AIR	Between Groups	12.233	3	4.078	5.680	.006
	Within Groups	14.357	20	.718		
	Total	26.590	23			
ABU	Between Groups	9.250E-02	3	3.083E-02	14.793	.000
	Within Groups	4.169E-02	20	2.084E-03		
	Total	.134	23			
LEMAK	Between Groups	14.106	3	4.702	14.795	.000
	Within Groups	6.356	20	.318		
	Total	20.462	23			
PROTEIN	Between Groups	1.607	3	.536	1.616	.217
	Within Groups	6.629	20	.331		
	Total	8.236	23			
DENSITAS	Between Groups	288.500	3	96.167	1442.500	.000
	Within Groups	1.333	20	6.667E-02		
	Total	289.833	23			
VISKOS	Between Groups	4.125E-02	3	1.375E-02	2.7E+31	.000
	Within Groups	1.007E-32	20	5.034E-34		
	Total	4.125E-02	23			

### Post Hoc Tests

### Homogeneous Subsets

AIR

Duncan <sup>a</sup>

AGEN	N	Subset for alpha = .05	
		1	2
"MATARAM 734"	6	87.867990	
"Dr.Cipto"	6		88.984202
SEBANDARAN	6		89.241050
MATARAM TOKO	6		89.836800
Sig.		1.000	.114

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 6.000.

**LEMAK**

Duncan <sup>a</sup>

AGEN	N	Subset for alpha = .05	
		1	2
"Dr.Cipto"	6	2.780893	
SEBANDARAN	6	3.237745	
"MATARAM 734"	6		4.185493
MATARAM TOKO	6		4.730000
Sig.		.178	.110

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 6.000.

**ABU**

Duncan <sup>a</sup>

AGEN	N	Subset for alpha = .05	
		1	2
"MATARAM 734"	6	.701700	
SEBANDARAN	6	.707938	
"Dr.Cipto"	6	.727732	
MATARAM TOKO	6		.854100
Sig.		.382	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 6.000.

**PROTEIN**

Duncan <sup>a</sup>

AGEN	N	Subset for alpha = .05
		1
MATARAM TOKO	6	3.470533
SEBANDARAN	6	3.798247
"Dr.Cipto"	6	3.942358
"MATARAM 734"	6	4.185493
Sig.		.081

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 6.000.

### DENSITAS

Duncan <sup>a</sup>

AGEN	N	Subset for alpha = .05			
		1	2	3	4
SEBANDARAN	6	1024.00			
"Dr.Cipto"	6		1025.00		
MATARAM TOKO	6			1030.67	
"MATARAM 734"	6				1032.00
Sig.		1.000	1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 6.000.

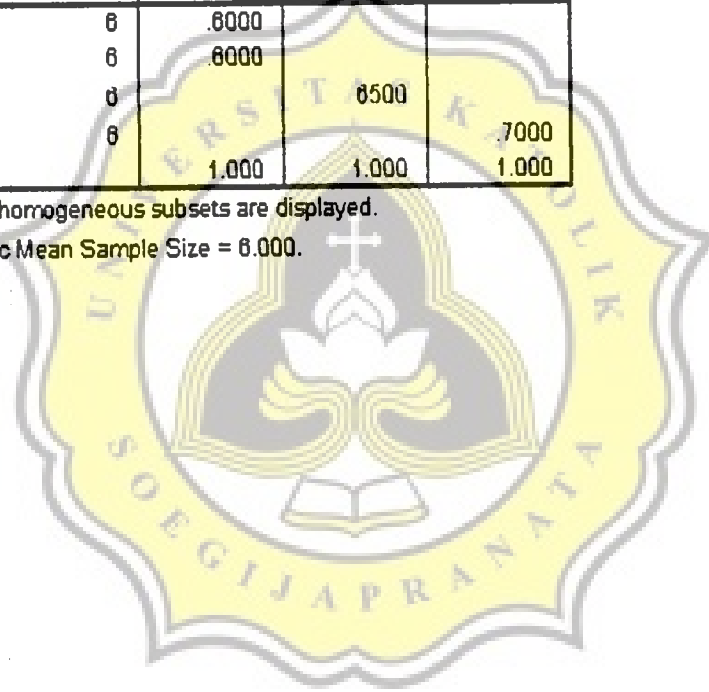
### VISKOS

Duncan <sup>a</sup>

AGEN	N	Subset for alpha = .05		
		1	2	3
"Dr.Cipto"	6	.6000		
SEBANDARAN	6	.6000		
"MATARAM 734"	6		.6500	
MATARAM TOKO	6			.7000
Sig.		1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 6.000.



Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
						AIR	"Dr.Cipto"		
	"MATARAM 734"	6	87.867990	.444304	.181386	87.401721	88.334259	87.2968	88.3128
	SEBANDARAN	6	89.241050	1.340029	.547085	87.834776	90.647324	88.2333	91.8124
	MATARAM TOKO	6	89.836800	.871809	.356915	88.921882	90.751708	89.3874	91.6079
	Total	24	88.982510	1.075221	.219479	88.528484	89.436637	87.2968	91.8124
ABU	"Dr.Cipto"	6	.727732	1.82293E-02	7.44E-03	.709501	.746862	.7002	.7542
	"MATARAM 734"	6	.701700	5.84650E-02	2.39E-02	.640356	.763045	.6454	.7929
	SEBANDARAN	6	.707938	6.71484E-02	2.74E-02	.637470	.778406	.6062	.8068
	MATARAM TOKO	6	.854100	8.89202E-03	3.63E-03	.844768	.863432	.8421	.8676
	Total	24	.747867	7.63817E-02	1.56E-02	.715614	.780121	.6062	.8676
LEMAK	"Dr.Cipto"	6	2.780693	.724098	.296612	2.020799	3.540587	2.2077	4.1097
	"MATARAM 734"	6	4.185483	.837295	.341824	3.306806	5.064181	2.8598	5.3623
	SEBANDARAN	6	3.237745	.137903	5.63E-02	3.093025	3.382465	3.0863	3.4577
	MATARAM TOKO	6	4.730000	.163707	6.68E-02	4.568200	4.901800	4.4500	4.9600
	Total	24	3.733483	.943203	.192531	3.335203	4.131763	2.2077	5.3623
PROTEIN	"Dr.Cipto"	6	3.942358	.494022	.201684	3.423913	4.460802	3.3961	4.6400
	"MATARAM 734"	6	4.185483	.837295	.341824	3.306806	5.064181	2.8598	5.3623
	SEBANDARAN	6	3.798247	.486395	.203469	3.275213	4.321281	3.0386	4.2004
	MATARAM TOKO	6	3.470533	.353776	.148511	3.088774	3.852293	2.8598	3.9323
	Total	24	3.849158	.936396	.122147	3.596477	4.101838	2.8598	5.3623
DENSITAS	"Dr.Cipto"	6	1025.00	.00	.00	1025.00	1025.00	1025	1025
	"MATARAM 734"	6	1032.00	.00	.00	1032.00	1032.00	1032	1032
	SEBANDARAN	6	1024.00	.00	.00	1024.00	1024.00	1024	1024
	MATARAM TOKO	6	1030.67	.52	.21	1030.12	1031.21	1030	1031
	Total	24	1027.92	3.55	.72	1026.42	1029.42	1024	1032
VISKOS	"Dr.Cipto"	6	6000	1.697E-17	6.928E-18	6000	6000	60	60
	"MATARAM 734"	6	6500	1.697E-17	6.928E-18	6500	6500	65	65
	SEBANDARAN	6	6000	1.697E-17	6.928E-18	6000	6000	60	60
	MATARAM TOKO	6	7000	3.391E-17	1.384E-17	7000	7000	70	70
	Total	24	6375	4.235E-02	8.645E-03	6196	6554	60	70

Correlations analysis for TPC, *S. aureus* and milk composition for each samples.

Correlations

		TPC	S_AUREUS	PH	AIR	ABU	LEMAK	PROTEIN
TPC	Pearson Correlation	1.000	.052	-.486*	.174	-.398	-.681**	-.026
	Sig. (2-tailed)		.808	.014	.416	.054	.000	.902
	N	24	24	24	24	24	24	24
S_AUREUS	Pearson Correlation	.052	1.000	-.553**	-.388	-.360	-.248	.522*
	Sig. (2-tailed)	.808		.005	.061	.057	.242	.009
	N	24	24	24	24	24	24	24
PH	Pearson Correlation	-.486*	-.553**	1.000	.542**	.829**	.486*	-.396
	Sig. (2-tailed)	.014	.005		.006	.000	.016	.055
	N	24	24	24	24	24	24	24
AIR	Pearson Correlation	.174	-.388	.542**	1.000	.646**	.054	-.264
	Sig. (2-tailed)	.416	.061	.006		.001	.802	.213
	N	24	24	24	24	24	24	24
ABU	Pearson Correlation	-.398	-.360	.829**	.646**	1.000	.394	-.366
	Sig. (2-tailed)	.054	.057	.000	.001		.057	.062
	N	24	24	24	24	24	24	24
LEMAK	Pearson Correlation	-.681**	-.248	.486*	.054	.394	1.000	.070
	Sig. (2-tailed)	.000	.242	.016	.802	.057		.745
	N	24	24	24	24	24	24	24
PROTEIN	Pearson Correlation	-.026	.522*	-.396	-.264	-.366	.070	1.000
	Sig. (2-tailed)	.902	.009	.055	.213	.062	.745	
	N	24	24	24	24	24	24	24

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\* . Correlation is significant at the 0.01 level (2-tailed).

--- PARTIAL CORRELATION COEFFICIENTS ---

Zero Order Partial

	PH	AIR	LEMAK	PROTEIN	TPC	S_AUREUS
PH	1.0000	.5423	.4847	-.3964	-.4962	-.5529
	( 0)	( 22)	( 22)	( 22)	( 22)	( 22)
	P = .	P = .006	P = .802	P = .213	P = .416	P = .061
AIR	.5423	1.0000	.0541	-.2638	.1739	-.3881
	( 22)	( 0)	( 22)	( 22)	( 22)	( 22)
	P = .	P = .	P = .802	P = .213	P = .1739	P = .061
LEMAK	.4847	.0541	1.0000	.0700	-.6806	-.2482
	( 22)	( 22)	( 0)	( 22)	( 22)	( 22)
	P = .016	P = .016	P = .	P = .745	P = .000	P = .242
PROTEIN	-.3964	-.2638	.0700	1.0000	-.0265	.5218
	( 22)	( 22)	( 22)	( 0)	( 22)	( 22)
	P = .055	P = .213	P = .745	P = .	P = .902	P = .009
TPC	-.4962	.1739	-.6806	-.0265	1.0000	.0525
	( 22)	( 22)	( 22)	( 22)	( 0)	( 22)
	P = .014	P = .416	P = .000	P = .902	P = .	P = .808
S_AUREUS	-.5529	-.3881	-.2482	.5218	.0525	1.0000
	( 22)	( 22)	( 22)	( 22)	( 22)	( 0)
	P = .005	P = .061	P = .242	P = .009	P = .808	P = .

(Coefficient / (D.F.) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

- - - P A R T I A L C O R R E L A T I O N C O E F F I C I E N T S - - -

Controlling for.. TPC S\_AUREUS

	PH	AIR	LEMAK	PROTEIN
PH	1.0000 ( 0) P= .	.6742 ( 20) P= .001	.0718 ( 20) P= .751	-.2268 ( 20) P= .310
AIR	.6742 ( 20) P= .001	1.0000 ( 0) P= .	.1390 ( 20) P= .537	-.0663 ( 20) P= .769
LEMAK	.0718 ( 20) P= .751	.1390 ( 20) P= .537	1.0000 ( 0) P= .	.2739 ( 20) P= .217
PROTEIN	-.2268 ( 20) P= .310	-.0663 ( 20) P= .769	.2739 ( 20) P= .217	1.0000 ( 0) P= .

(Coefficient / (D.F.) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

