LAMPIRAN A

DATA SURVEY DAN PETA LOKASI

Lampiran A1.

Data Survey Untuk Rambut Pekerja Jalanan (Tukang Parkir, Petugas Pom Bensin Dan Tukang Sapu Jalanan) Di Sekitar Daerah Jalan Pandanaran

No	Sampel	Usia (tahun)	Lama Bekerja (tahun)	Lokasi	Pekerjaan
1	S. 1	23	3	Samping Baiturahman	Tukang Sapu
2	S. 2	29	9	Pom Bensin	Petugas Pom
3	S. 3	25	5	Gramedia	Tukang Parkir
4	S. 4	20	1	Depan Toko Universal	Tukang Parkir
5	S. 5	48	30	Pom Bensin	Petugas Pom
6	S. 6	29	1	Pom Bensin	Petugas Pom
7	S. 7	24	2.5	Pertigaan Pom	Tukang Sapu
8	S. 8	49	4	Gramedia Dalam	Tukang Parkir
9	S. 9	35	5	Gramedia	Tukang Parkir
10	S. 10	23	1.5	DepanPom Bensin	Tukang Sapu
11	S. 11	55	30	Pom Bensin	Petugas Pom
12	S. 12	50	6	RS. Wardi Waluyo	Tukang Parkir
13	S. 13	39	9	Samping Baiturahman	Tukang Sapu
14	S. 14	22	3	Samping Baiturahman	Tukang Sapu
15	S. 15	47	7	Samping Baiturahman	Tukang Sapu
16	S. 16	58	33	Pom Bensin	Petugas Pom
17	S. 17	22	1.5	Depan Pom Bensin	Tukang Sapu
18	S. 18	25	5	Toko Juwono	Tukang Parkir
19	S. 19	22	5	Pom Bensin	Petugas Pom
20	S. 20	60	35	Pom Bensin	Petugas Pom
21	S. 21	36	1	Pom Bensin	Petugas Pom
22	S. 22	63	7	Restoran Danti	Tukang Parkir
23	S. 23	43	6	Suara Merdeka	Tukang Parkir
24	S. 24	38	12	Pom Bensin	Petugas Pom
25	S. 25	50	20	Pom Bensin	Petugas Pom
26	S. 26	57	30	Pom Bensin	Petugas Pom
27	S. 27	25	2	Restoran Danti	Tukang Parkir
28	S. 28	36	5	Gajah Mada Plaza	Tukang Parkir
29	S. 29	60	6	Pom Bensin	Petugas Pom
30	S. 30	64	38	Pom Bensin	Petugas Pom
31	S. 31	28	6	Samping Baiturahman	Tukang Sapu
32	S. 32	65	41	Pom Bensin	Petugas Pom
33	S. 33	22	3	Samping Baiturahman	Tukang Sapu
34	S. 34	60	30	Pom Bensin	Petugas Pom
35	S. 35	27	10	Pom Bensin	Petugas Pom
36	S. 36	39	15	Pom Bensin	Petugas Pom
37	S. 37	22	2	Gramedia	Tukang Parkir
38	S.38	55	39	Pom Bensin	Petugas Pom

Lampiran A2.

Data Survey Untuk Rambut Petani Di Daerah Gunung Pati

No	Sampel	Usia (tahun)	Lama Bekerja (tahun)	Lokasi	Pekerjaan
1	S. 1	40	20	Sekaran	Buruh tani
2	S. 2	32	20	Sekaran	Buruh tani
3	S. 3	32	20	Sekaran	Buruh tani
4	S. 4	35	20	Sekaran	Buruh tani
5	S. 5	27	15	Sekaran	Buruh tani
6	S. 6	50	30	Sekaran	Buruh tani
7	S. 7	33	20	Sekaran	Buruh tani
8	S. 8	60	40	Sekaran	Buruh tani
9	S. 9	40	25	Sekaran	Buruh tani
10	S. 10	48	30	Sekaran	Buruh tani
11	S. 11	26	15	Sekaran	Buruh tani
12	S. 12	30	20	Sekaran	Buruh tani
13	S. 13	57	34	Sekaran	Buruh tani
14	S. 14	30	15	Sekaran	Buruh tani
15	S. 15	35	20	Sekaran	Buruh tani
16	S. 16	43	22	Sekaran	Buruh tani
17	S. 17	40	20	Sekaran	Buruh tani
18	S. 18	29	15	Sekaran	Buruh tani
19	S. 19	49	20	Banaran	Buruh tani
20	S. 20	69	40	Banaran	Buruh tani
21	S. 21	22	8	Banaran	Buruh tani
22	S. 22	45	25	Banaran	Buruh tani
23	S. 23	45	22	Banaran	Buruh tani
24	S. 24	64	44	Banaran	Buruh tani
25	S. 25	69	40	Banaran	Buruh tani
26	S. 26	35	21	Banaran	Buruh tani
27	S. 27	38	22	Banaran	Buruh tani
28	S. 28	35	20	Banaran	Buruh tani
29	S. 29	60	40	Banaran	Buruh tani
30	S. 30	48	25	Banaran	Buruh tani
31	S. 31	28	15	Patemon	Buruh tani
32	S. 32	55	35	Patemon	Buruh tani
33	S. 33	40	20	Patemon	Buruh tani

Lampiran A3.

<u>Contoh kuisioner yang digunakan</u>

Kuisioner

Data Pribadi Pemilik Rambut

Nama   : ....

Usia   : ....

Pekerjaan   : ....

Lama bekerja : ....

Lokasi   : ....

Kode sampel : S. ....
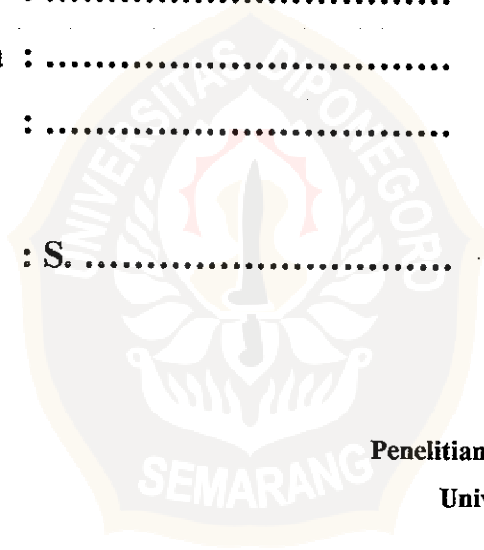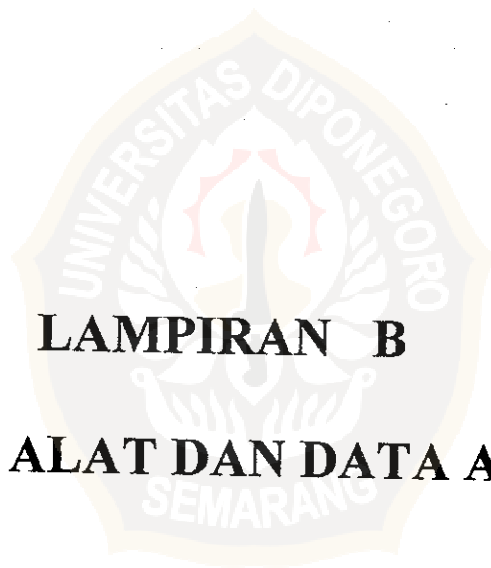
Penelitian Jurusan Fisika-FMIPA

Universitas Diponegoro

Lampiran A4.

LAMPIRAN B

OPTIMASI ALAT DAN DATA ANALISIS

Optimasi Alat

Adapun hasil optimasi pada alat Spektrofotometri Serapan Atom yang telah dilakukan adalah sebagai berikut :

1. Panjang gelombang   : 217,0 nm

2. Lebar celah   : 0,5 nm

3. Arus lampu   : 4,0 mA

4. Suhu Pengeringan   : 300°C

5. Waktu Pengeringan   : 12,8 detik

6. Suhu pengabuan   : 600°C

7. Waktu pengabuan   : 23 detik

8. Suhu atomisasi   : 1700°C

9. Waktu atomisasi   : 3,7 detik

10. Kecepatan kenaikan suhu

     atomisasi   : 1500°C / detik

11. Waktu pendinginan   : 2,3 detik
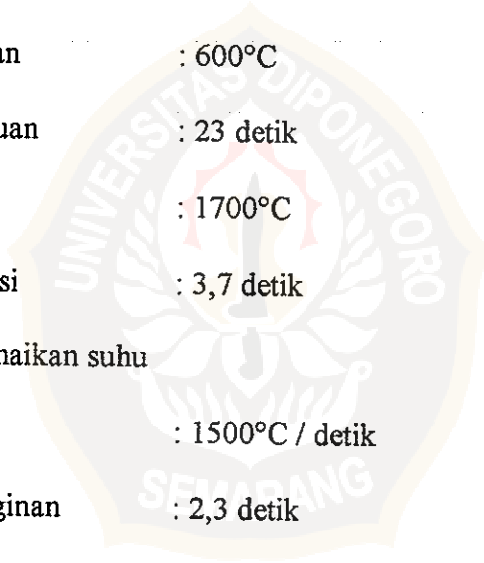
Lampiran B2.

Tabel. Hubungan antara usia dengan kadar Pb dalam rambut pekerja jalanan

No	Usia (thn)	Kadar Pb (ug/g) Dalam rambut
1	20	$0,972 \pm 0,002$
2	22	$1,345 \pm 0,002$
3	22	$1,949 \pm$
4	22	$1,291 \pm 0,002$
5	22	$2,138 \pm 0,002$
6	22	$1,429 \pm 0,002$
7	23	$1,798 \pm 0,002$
8	23	$1,972 \pm$
9	24	$1,647\pm$
10	25	$1,347 \pm$
11	25	$1,961 \pm 0,003$
12	25	$2,305 \pm 0,002$
13	27	$3,837 \pm 0,003$
14	28	$3,101 \pm 0,003$
15	29	$0,837 \pm 0,002$
16	29	$3,389 \pm 0,003$
17	35	$2,381 \pm 0,003$
18	36	$1,107 \pm 0,002$
19	36	$2,265 \pm 0,002$
20	38	$3,819 \pm 0,003$
21	39	$4,089 \pm 0,003$
22	39	$3,171 \pm 0,002$
23	43	$3,320 \pm 0,003$
24	47	$2,827 \pm 0,003$
25	48	$4,334 \pm 0,035$
26	49	$2,327 \pm$
27	50	$3,009 \pm 0,002$
28	50	$4,222 \pm 0,009$
29	55	$3,936 \pm 0,002$
30	55	$4,979 \pm 0,003$
31	57	$3,756 \pm$
32	58	$4,637 \pm 0,010$
33	60	$4,760 \pm 0,015$
34	60	$4,598 \pm 0,003$
35	60	$9,551 \pm 0,095$
36	63	$2,949 \pm 0,003$
37	64	$6,635 \pm 0,002$
38	65	$3,969 \pm 0,014$

Lampiran B3.

Tabel. Hubungan antara usia dengan kadar Pb dalam rambut petani

No	Usia (thn)	Kadar Pb(ug/g) Dalam rambut
1	22	$0,323 \pm 0,001$
2	26	$0,374 \pm 0,001$
3	27	$0,602 \pm 0,002$
4	28	$0,542 \pm 0,001$
5	29	$0,442 \pm 0,001$
6	30	$0,618 \pm 0,001$
7	30	$0,515 \pm 0,001$
8	32	$0,631 \pm 0,001$
9	32	$0,714 \pm 0,001$
10	33	$4,400 \pm 0,003$
11	35	$1,671 \pm 0,002$
12	35	$0,719 \pm 0,001$
13	35	$0,946 \pm 0,002$
14	35	$1,589 \pm 0,002$
15	38	$1,676 \pm 0,002$
16	40	$1,851 \pm 0,002$
17	40	$0,881 \pm 0,002$
18	40	$0,902 \pm 0,001$
19	40	$1,338 \pm 0,002$
20	43	$0,998 \pm 0,002$
21	45	$1,772 \pm 0,003$
22	45	$1,994 \pm 0,002$
23	48	$2,866 \pm 0,003$
24	48	$1,913 \pm 0,002$
25	49	$1,251 \pm 0,002$
26	50	$2,486 \pm 0,003$
27	55	$2,409 \pm 0,003$
28	57	$2,726 \pm 0,003$
29	60	$3,057 \pm 0,002$
30	60	$3,020 \pm 0,003$
31	64	$3,050 \pm 0,003$
32	69	$2,913 \pm 0,003$
33	69	$2,892 \pm 0,003$

Lampiran B4.

Tabel. Hubungan antara lama bekerja dengan kadar Pb dalam rambut pekerja jalanan

No	Lama bekerja (thn)	Kadar Pb(ug/g) Dalam rambut
1	1	$1,107 \pm 0,002$
2	1	$0,837 \pm 0,002$
3	1	$0,972 \pm 0,002$
4	1,5	$1,291 \pm 0,002$
5	1,5	$1,798 \pm 0,002$
6	2	$1,347 \pm$
7	2	$1,429 \pm 0,002$
8	2,5	$1,647 \pm$
9	3	$1,345 \pm 0,002$
10	3	$1,949 \pm$
11	3	$1,972 \pm$
12	4	$2,327 \pm$
13	5	$1,961 \pm 0,003$
14	5	$2,305 \pm 0,002$
15	5	$2,138 \pm 0,002$
16	5	$2,265 \pm 0,002$
17	5	$2,381 \pm 0,003$
18	6	$3,009 \pm 0,002$
19	6	$3,101 \pm 0,003$
20	6	$3,320 \pm 0,003$
21	6	$9,551 \pm 0,095$
22	7	$2,949 \pm 0,003$
23	7	$2,827 \pm 0,003$
24	9	$3,389 \pm 0,003$
25	9	$3,171 \pm 0,002$
26	10	$3,837 \pm 0,003$
27	12	$3,819 \pm 0,003$
28	15	$4,089 \pm 0,003$
29	20	$4,222 \pm 0,009$
30	30	$3,936 \pm 0,002$
31	30	$4,334 \pm 0,035$
32	30	$3,756 \pm$
33	30	$4,598 \pm 0,003$
34	33	$4,637 \pm 0,010$
35	35	$4,760 \pm 0,015$
36	38	$6,635 \pm 0,002$
37	39	$4,979 \pm 0,003$
38	41	$3,969 \pm 0,014$

Lampiran B5.

Tabel. Hubungan antara lama bekerja dengan kadar Pb dalam rambut petani

No	Lama bekerja (thn)	Kadar Pb (ug/g) Dalam rambut
1	8	$0{,}323 \pm 0{,}001$
2	15	$0{,}602 \pm 0{,}002$
3	15	$0{,}442 \pm 0{,}001$
4	15	$0{,}374 \pm 0{,}001$
5	15	$0{,}542 \pm 0{,}001$
6	15	$0{,}515 \pm 0{,}001$
7	20	$0{,}618 \pm 0{,}001$
8	20	$0{,}631 \pm 0{,}001$
9	20	$4{,}400 \pm 0{,}003$
10	20	$0{,}719 \pm 0{,}001$
11	20	$0{,}881 \pm 0{,}002$
12	20	$0{,}902 \pm 0{,}001$
13	20	$0{,}714 \pm 0{,}001$
14	20	$0{,}946 \pm 0{,}002$
15	20	$1{,}251 \pm 0{,}002$
16	20	$1{,}338 \pm 0{,}002$
17	20	$1{,}589 \pm 0{,}002$
18	21	$1{,}671 \pm 0{,}002$
19	22	$0{,}998 \pm 0{,}002$
20	22	$1{,}772 \pm 0{,}003$
21	22	$1{,}676 \pm 0{,}002$
22	25	$1{,}851 \pm 0{,}002$
23	25	$1{,}913 \pm 0{,}002$
24	25	$1{,}994 \pm 0{,}002$
25	30	$2{,}866 \pm 0{,}003$
26	30	$2{,}486 \pm 0{,}003$
27	34	$2{,}726 \pm 0{,}003$
28	35	$2{,}409 \pm 0{,}003$
29	40	$2{,}913 \pm 0{,}003$
30	40	$3{,}020 \pm 0{,}003$
31	40	$2{,}892 \pm 0{,}003$
32	40	$3{,}057 \pm 0{,}002$
33	44	$3{,}050 \pm 0{,}003$

LAMPIRAN C

UJI HIPOTESIS

Lampiran C1

1. Uji Statistik - t (Supranto, 1996)

Pada penelitian ini diperoleh dua harga rata-rata, maka pada analisis statistik digunakan metoda t-test. Untuk menghitung harga t digunakan rumus t-test sebagai berikut:

$$t_0 = \frac{\overline{X}_1 - \overline{X}_2}{S_p \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \qquad , \qquad t_0 = t_{hitung}$$

$$S_p^2 = \frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}$$

Apabila taraf keberartian (*signifikansi*) α sudah ditentukan nilainya, maka $t_{n_1 + n_2 - 2}$ dapat dilihat dalam tabel distribusi-t .

Jika $t_{hitung} \geq t_{n_1 + n_2 - 2}$, maka H_0 ditolak dan jika $t_{hitung} < t_{n_1 + n_2 - 2}$, maka H_0 diterima.

2. Uji Regresi Linier Ganda (Sudjana, 1992)

Untuk mengetahui hubungan antara usia, lama bekerja dengan kadar Pb dalam rambut pada pekerja jalanan dan petani secara tepat, maka dapat dilakukan pengujian dengan menggunakan metoda analisis regresi linier ganda, jika peubah bebas itu $X_1, X_2, \ldots, X_k$ dapat dirumuskan:

$$\hat{Y} = b_0 + b_1 X_1 + b_2 X_2 + \ldots + b_k X_k$$

dengan vektor kolom $\underline{b} = \begin{pmatrix} b_0 \\ b_1 \\ \cdot \\ \cdot \\ \cdot \\ b_k \end{pmatrix}$ dengan transposnya berbentuk vektor baris

Disebabkan karena terdapat k buah, $k \geq 2$ peubah

$$b^{'} = (b_0, b_1, \dots b_k).$$

dan vektor kolom $\underline{X} = \begin{pmatrix} X_1 \\ X_2 \\ \cdot \\ \cdot \\ \cdot \\ X_k \end{pmatrix}$ dengan transpos $\underline{X}^{'} = (X_1, X_2, \dots X_k)$ maka

model regresi linear ganda di atas, dapat ditulis dalam bentuk (untuk

sementara $\hat{Y}$ diganti oleh Y).

$$Y = \underline{X}'\underline{b}$$

Untuk menentukan vektor b atau koefesien-koefesien $b_0, b_1, \dots, b_k$ dapat

dilihat pada tabel pengamatan berikut:

Tabel. Pengamatan untuk regresi linier ganda (Sudjana, 1992)

Responden	Pengamatan				
	X_1	X_2	...	X_k	Y
1	X_{11}	X_{21}	...	X_{k1}	Y_1
2	X_{12}	X_{22}	...	X_{k2}	Y_2
.	.	.		.	.
.	.	.		.	.
.	.	.		.	.
N	X_{1n}	X_{2n}	...	X_{kn}	Y_n

Selanjutnya diambil vektor kolom:

$$\underline{Y} = \begin{pmatrix} Y_1 \\ Y_2 \\ . \\ . \\ . \\ Y_n \end{pmatrix}$$ dengan transpos $\underline{Y}' = (Y_1 Y_2 ... Y_n)$ dan bentuk matriks berikut

$$\underset{\sim}{X} = \begin{pmatrix} 1 & X_{11} & X_{21} & . & . & . & X_{k1} \\ 1 & X_{12} & X_{22} & . & . & . & X_{k2} \\ . & . & . & . & . & . & . \\ . & . & . & . & . & . & . \\ . & . & . & . & . & . & . \\ 1 & X_{1n} & X_{2n} & . & . & . & X_{kn} \end{pmatrix}$$

dengan transposnya:

$$\underset{\sim}{X'} = \begin{pmatrix} 1 & 1 & 1 & . & . & . & 1 \\ X_{11} & X_{12} & X_{13} & . & . & . & X_{1n} \\ X_{21} & X_{22} & X_{23} & . & . & . & X_{2n} \\ . & . & . & . & . & . & . \\ . & . & . & . & . & . & . \\ X_{kn} & X_{k2} & X_{2n} & . & . & . & X_{kn} \end{pmatrix}$$

Atau dalam notasi vektor dan matriks menjadi

$$\underline{Y} = X b$$

Dengan mengalikan persamaan di atas dari sebelah kiri dengan X' dan hasilnya dikalikan kembali dari sebelah kiri dengan inversnya $\underset{\sim}{X'}\underset{\sim}{X}$ yaitu $(\underset{\sim}{X'}\underset{\sim}{X})^{-1}$ sehingga diperoleh :

$$\underline{b} = (X'X)^{-1} X'Y$$

Persamaan di atas dapat digunakan untuk mencari koefesien regresi linier ganda dalam bentuk matriks. Dalam bentuk jumlah kuadrat data pengamatan Xij, elemen-elemen matriks adalah sebagai berikut:

$$(X'X) = \begin{pmatrix} n & \Sigma X_{1i} & \Sigma X_{2i} & ... & \Sigma X_{ki} \\ \Sigma X_{1i} & \Sigma X_{1i}^2 & \Sigma X_{1i}X_{2i} & ... & \Sigma X_{1i}X_{ki} \\ \Sigma X_{2i} & \Sigma X_{2i}X_{1i} & \Sigma X_{2i}^2 & ... & \Sigma X_{2i}X_{ki} \\ . & . & . & ... & . \\ . & . & . & ... & . \\ . & . & . & ... & . \\ \Sigma X_{ki} & \Sigma X_{ki}X_{1i} & \Sigma X_{ki}X_{2i} & ... & \Sigma X_{ki}^2 \end{pmatrix}$$

$$X'Y = \begin{pmatrix} \Sigma Y_i \\ \Sigma X_{1i}Y_i \\ \Sigma X_{2i}Y_i \\ . \\ . \\ . \\ \Sigma X_{ki}Y_i \end{pmatrix}$$

Pengujian regresi linier ganda dilakukan dengan tujuan untuk meyakinkan regresi yang didapat berdasarkan penelitian ada artinya bila dipakai untuk membuat kesimpulan mengenai hubungan sejumlah peubah yang dikehendaki. an sebagai berikut :

$$JK(\mathbf{Reg}) = b\left(\underset{\sim}{X}' \underline{Y} \right) - n\overline{Y}^2$$

$$JK(\mathbf{TD}) = \overline{Y}'\underline{Y} - n\overline{Y}^2$$

$$JK(\mathbf{S}) = JK(\mathbf{TD}) - JK(\mathbf{Reg})$$

Untuk mempermudahkan perhitungan, nilai yang diperoleh dimasukkan dalam tabel anova.

Tabel .Daftar Anova untuk Regresi Linear Ganda (Sudjana, 1992)

Sumber Variasi	DK	JK	KT	F
Total	N	$\underline{Y}^2\underline{Y}$		
Koefisien (b_o)	1	$n\overline{Y}^2$		
Total Dikoreksi (TD)	n-1	$\underline{Y}^1\underline{Y} - n\overline{Y}^2$		
Regresi (Reg)	k	$\underline{b}^1\left(\underset{\sim}{X}^1\underline{Y}\right) - n\overline{Y}^2$	JK(Reg)/k	$\dfrac{KT(Reg)}{KT(s)}$
Sisa	n-k-1	JK(TD)-JK(Reg)	JK(S)/(n-k-1)	

Berdasarkan adanya regresi linier ganda, koefesien korelasi ganda yang sering disingkat denga R, dapat dihitung dengan menggunakan rumus :

$$R^2 = \frac{JK(Reg)}{\sum y^2}$$

Meskipun ternyata regresi ini berarti, untuk menilai "ketepatan" masih perlu diuji dengan galat baku taksiran yang dihitung dengan rumus :

$$s^2_{y.12...k} = \frac{JK(s)}{(n-k-1)}$$

$$s^2_{bi} = \frac{s^2_{y.12...k}}{\sum x^2_{ij}\left(1-R^2_i\right)}$$

$$t = b_i / s_{bi}$$

Selanjutnya dapat digunakan distribusi t dengan kriteria, hipotesis ditolak jika | t | terlalu besar dibandingkan dengan t dari tabel distribusi t. Begitu pula dengan sebaliknya, dengan memperhitungkan taraf α yang dipilih.

Lampiran C2

Tabel Hasil analisis signifikansi hubungan antara usia dengan kadar Pb dalam rambut pekerja jalanan dan petani

Kelompok	Petani			P. Jalanan		
	$I_{hitung} I$	t_α	Analisis	$I_{hitung} I$	t_α	Analisis
A – B	1362.34	2.160	Ditolak	2075.25	2.086	Ditolak
A - C	1872.89	2.160	Ditolak	2481.97	2.101	Ditolak
A - D	2685.84	2.447	Ditolak	5392.25	2.086	Ditolak
A - E	4440.22	2.306	Ditolak	7516.93	2.086	Ditolak
B - C	985.35	2.101	Ditolak	690.85	2.306	Ditolak
B - D	3227.86	2.201	Ditolak	2363.73	2.228	Ditolak
B - E	5394.64	2.160	Ditolak	3909.28	2.228	Ditolak
C - D	2633.09	2.201	Ditolak	1011.93	2.306	Ditolak
C - E	4505.37	2.160	Ditolak	1967.68	2.306	Ditolak
D - E	450.09	2.447	Ditolak	1137.65	2.228	Ditolak

Dari tabel di atas, diperoleh hasil untuk pengelompokan usia ternyata $t_{hitung} \geq t_\alpha$ sehingga H_0 ditolak. Ini berarti terdapat perbedaan rata – rata kadar Pb yang dikandung oleh rambut dalam setiap kelompoknya
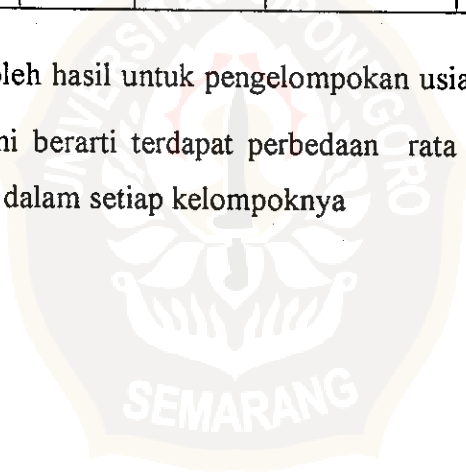
Perhitungan untuk tabel analisis hubungan pengaruh usia dengan kadar Pb dalam rambut pekerja jalanan dan petani

1. Petani

A – B

$$Sp^2 = \frac{4(0,000485)^2 + 9(0,000432)^2}{5+10-2}$$

$$Sp^2 \quad = 2,016 \cdot 10^{-7}$$

$$Sp \quad = 4,489 \cdot 10^{-4}$$

$$|thit| \quad = \frac{0,335}{2,459.10^{-4}}$$

$$|thit| \quad = 1362,34$$

$$t\ tabel \quad = 2,160$$

A – C

$$Sp^2 = \frac{4(0,000485)^2 + 9(0,000567)^2}{5+10-2}$$

$$Sp^2 \quad = 2,949 \cdot 10^{-7}$$

$$Sp \quad = 5,430 \cdot 10^{-4}$$

$$|thit| \quad = \frac{0,557}{2,974.10^{-4}}$$

$$|thit| \quad = 1`872,89$$

$$t\ tabel \quad = 2,160$$

A – D

$$Sp^2 = \frac{4(0,000485)^2 + 2(0,001732)^2}{5+3-2}$$

$$Sp^2 \quad = 1,157 \cdot 10^{-6}$$

$$Sp \quad = 8,158 \cdot 10^{-4}$$

$$|thit| \quad = \frac{2,11}{7,856.10^{-4}}$$

$$|thit| \quad = 2685,84$$

$$t\ tabel = 2,447$$

A – E

$$Sp^2 = \frac{4(0,000485)^2 + 4(0,0012)^2}{5+5-2}$$

$$Sp^2 \quad = 1,959 \cdot 10^{-6}$$

$$Sp \quad = 1,399 \cdot 10^{-3}$$

$$|thit| \quad = \frac{2,57}{5,788.10^{-3}}$$

$$|thit| \quad = 4440,22$$

$$t\ tabel \quad = 2,306$$

B – C

$$Sp^2 = \frac{9(0,000432)^2 + 9(0,000567)^2}{10+10-2}$$

$$Sp^2 \quad = 2,54 \cdot 10^{-7}$$

$$Sp \quad = 5,039 \cdot 10^{-4}$$

$$|thit| \quad = \frac{0,222}{2,253.10^{-4}}$$

$$|thit| \quad = 985,35$$

t tabel   = 2,101

B – D

$$Sp^2 = \frac{9(0,000432)^2 + 2(0,001732)^2}{10+3-2}$$

Sp^2 $= 6,98 \cdot 10^{-7}$

Sp $= 8,355 \cdot 10^{-4}$

$|thit|$ $= \dfrac{1,775}{5,499 \cdot 10^{-4}}$

$|thit|$ $= 3227,86$

t tabel $= 2,201$

B – E

$$Sp^2 = \frac{9(0,000432)^2 + 4(0,0012)^2}{10+5-2}$$

Sp^2 $= 5,722 \cdot 10^{-7}$

Sp $= 7,564 \cdot 10^{-4}$

$|thit|$ $= \dfrac{2,235}{4,143 \cdot 10^{-4}}$

$|thit|$ $= 5394,64$

t tabel $= 2,160$

C – D

$$Sp^2 = \frac{9(0,000567)^2 + 2(0,001732)^2}{10+3-2}$$

Sp^2 $= 6,656 \cdot 10^{-7}$

Sp $= 8,964 \cdot 10^{-4}$

$|thit|$ $= \dfrac{1,553}{5,898 \cdot 10^{-4}}$

$|thit|$ $= 2633,09$

t tabel $= 2,201$

C – E

$$Sp^2 = \frac{9(0,000567)^2 + 4(0,0012)^2}{10+5-2}$$

Sp^2 $= 6,656 \cdot 10^{-7}$

Sp $= 8,158 \cdot 10^{-4}$

$|thit|$ $= \dfrac{2,013}{4,408 \cdot 10^{-4}}$

$|thit|$ $= 4505,37$

tabel $= 2,160$

D – E

$$Sp^2 = \frac{2(0,001732)^2 + 4(0,0012)^2}{3+5-2}$$

Sp^2 $= 1,959 \cdot 10^{-6}$

Sp $= 1,399 \cdot 10^{-3}$

$|thit|$ $= \dfrac{0,460}{1,022 \cdot 10^{-3}}$

$|thit|$ $= 450,09$

t tabel $= 2,447$

2. Pekerjaan Jalanan

A – B

$$Sp^2 = \frac{15(0,000816)^2 + 5(0,001095)^2}{16+6-2}$$

$$Sp^2 = 7,991 \cdot 10^{-7}$$

$$Sp = 8,939 \cdot 10^{-4}$$

$$|thit| = \frac{0,888}{4,279 \cdot 10^{-4}}$$

$$|thit| = 2075,25$$

t tabel $= 2,086$

A – C

$$Sp^2 = \frac{15(0,000816)^2 + 3(0,002117)^2}{16+4-2}$$

$$Sp^2 = 1,302 \cdot 10^{-6}$$

$$Sp = 1,141 \cdot 10^{-3}$$

$$|thit| = \frac{1,583}{6.378 \cdot 10^{-4}}$$

$$|thit| = 2481,97$$

t tabel $= 2,101$

A – D

$$Sp^2 = \frac{15(0,000816)^2 + 5(0,001615)^2}{16+6-2}$$

$$Sp^2 = 1,151 \cdot 10^{-6}$$

$$Sp = 1,073 \cdot 10^{-3}$$

$$|thit| = \frac{2,770}{5,137 \cdot 10^{-4}}$$

$$|thit| = 5392,25$$

t tabel $= 2,086$

A – E

$$Sp^2 = \frac{15(0,000816)^2 + 5(0,001441)2}{16+6-2}$$

$$Sp^2 = 1,018 \cdot 10^{-6}$$

$$Sp = 1,049 \cdot 10^{-3}$$

$$|thit| = \frac{3,775}{5,022 \cdot 10^{-4}}$$

$$|thit| = 7516,93$$

t tabel $= 2,086$

B – C

$$Sp^2 = \frac{5(0,001095)^2 + 3(0,002117)^2}{6+4-2}$$

$$Sp^2 = 2,429 \cdot 10^{-6}$$

$$Sp = 1,559 \cdot 10^{-3}$$

$$|thit| = \frac{0,695}{1006 \cdot 10^{-3}}$$

$$|thit| = 690.85$$

t tabel $= 2,306$

B – D

$$Sp^2 = \frac{5(0,001095)^2 + 5(0,001615)^2}{6+6-2}$$

$Sp^2 \quad = 1,904.10^{-6}$

$Sp \quad = 1,379.10^{-3}$

$$|thit| \quad = \frac{1,882}{7,962.10^{-4}}$$

$|thit| \quad = 2363,73$

t tabel $\quad = 2,228$

B – E

$$Sp^2 = \frac{5(0,001095)^2 + 5(0,001441)}{6+6-2}$$

$Sp^2 \quad = 1,637.10^{-6}$

$Sp \quad = 1,279.10^{-3}$

$$|thit| \quad = \frac{2,887}{7,385.10^{-4}}$$

$|thit| \quad = 3909,28$

t tabel $\quad = 2,228$

C – D

$$Sp^2 = \frac{3(0,002117)^2 + 5(0,001615)^2}{4+6-2}$$

$Sp^2 \quad = 3,31.10^{-6}$

$Sp \quad = 1,819.10^{-3}$

$$|thit| \quad = \frac{1,188}{1,174.10^{-4}}$$

$|thit| \quad = 1011,93$

t tabel $\quad = 2,306$

C – E

$$Sp^2 = \frac{3(0,002117)^2 + 5(0,001441)^2}{4+6-2}$$

$Sp^2 \quad = 2,978.10^{-6}$

$Sp \quad = 1,726.10^{-3}$

$$|thit| \quad = \frac{2,192}{1,114.10^{-3}}$$

$|thit| \quad = 1967,68$

t tabel $\quad = 2,306$

D – E

$$Sp^2 = \frac{5(0,001615)^2 + 5(0,001441)^2}{6+6-2}$$

$Sp^2 \quad = 2,342.10^{-6}$

$Sp \quad = 1,530.10^{-3}$

$$|thit| \quad = \frac{1,005}{8,834.10^{-4}}$$

$|thit| \quad = 1137,65$

t tabel $\quad = 2,228$

Lampiran C3

Tabel. Hasil analisis signifikansi hubungan antara lama bekerja dengan kadar Pb dalam rambut pekerja jalanan dan petani

Kelompok	Petani			P. Jalanan		
	I t_{hitung} I	t_α	Analisis	I t_{hitung} I	t_α	Analisis
A – B	-	-	-	2309.73	2.060	Ditolak
A - C	-	-	-	2781.13	2.069	Ditolak
A - D	-	-	-	-	-	-
A - E	-	-	-	2654.73	2.052	Ditolak
A - F	-	-	-	5971.59	2.064	Ditolak
B - C	1330.98	2.120	Ditolak	351.29	2.776	Ditolak
B - D	1480.12	2.571	Ditolak	-	-	-
B - E	1370.30	3.183	Ditolak	459.46	2.306	Ditolak
B - F	1822.40	3.183	Ditolak	1807.69	2.571	Ditolak
C - D	4065.56	2.080	Ditolak	-	-	-
C - E	5151.85	2.093	Ditolak	37.63	2.447	Ditolak
C - F	6875.19	2.093	Ditolak	1027.32	3.183	Ditolak
C - G	7417.39	2.120	Ditolak	-	-	-
D - E	1260.01	2.306	Ditolak	-	-	-
D - F	1916.72	2.306	Ditolak	-	-	-
D - G	1466.08	2.571	Ditolak	-	-	-
E - F	371.63	2.447	Ditolak	1673.88	2.365	Ditolak
E - G	255.81	3.183	Ditolak	-	-	-
F - G	40.60	3.183	Ditolak	-	-	-

Dari tabel di atas, diperoleh hasil untuk pengelompokan lama bekerja ternyata $t_{hitung} \geq t_\alpha$ sehingga H_0 ditolak. Ini berarti terdapat perbedaan rata – rata kadar Pb yang dikandung oleh rambut dalam setiap kelompoknya

Perhitungan untuk tabel analisis hubungan pengaruh lama bekerja dengan kadar Pb dalam rambut pekerja jalanan dan petani

1. Petani

B – C

$$Sp^2 = \frac{0 + 16(0,000303)^2}{1 + 17 - 2}$$

$$Sp^2 = 9,1.10^{-8}$$

$$Sp = 0,000303$$

$$|thit| = \frac{0,415}{3,118.10^{-4}}$$

$$|thit| = 1330,98$$

t tabel = 2,120

B – D

$$Sp^2 = \frac{0 + 5(0,000857)^2}{1 + 6 - 2}$$

$$Sp^2 = 7,34.10^{-7}$$

$$Sp = 0,000857$$

$$|thit| = \frac{1,37}{9,256.10^{-4}}$$

$$|thit| = 1480,12$$

t tabel = 2,571

B – E

$$Sp^2 = \frac{0 + 3(0,0015)^2}{1 + 4 - 2}$$

$$Sp^2 = 2,25.10^{-6}$$

$$Sp = 0,0015$$

$$|thit| = \frac{2,298}{1,677.10^{-3}}$$

$$|thit| = 1370,30$$

t tabel = 3,183

B – F

$$Sp^2 = \frac{0 + 3(0,001309)^2}{1 + 4 - 2}$$

$$Sp^2 = 1,713.10^{-6}$$

$$Sp = 0,001309$$

$$|thit| = \frac{2,668}{1,464.10^{-3}}$$

$$|thit| = 1822,40$$

t tabel = 3,183

C – D

$$Sp^2 = \frac{16(0,000303)^2 + 5(0,000857)^2}{17 + 6 - 2}$$

$$Sp^2 = 2,44.10^{-7}$$

$$Sp = 4,947.10^{-4}$$

$$|thit| = \frac{0,955}{2,349.10^{-4}}$$

$$|thit| = 4065,56$$

t tabel = 2,080

C – E

$$Sp^2 = \frac{16(0,000303)^2 + 3(0,0015)^2}{17 + 4 - 2}$$

$$Sp = 4,32.10^{-7}$$

$$Sp = 6,577.10^{-4}$$

$$|\text{thit}| = \frac{1,883}{3,655.10^{-4}}$$

$$|\text{thit}| = 5151,85$$

t tabel = 2,093

C – F

$$Sp^2 = \frac{16(0,000303)^2 + 3(0,001309)^2}{17+4-2}$$

$$Sp^2 = 3,47.10^{-7}$$

$$Sp = 5,897.10^{-4}$$

$$|\text{thit}| = \frac{2,253}{3,277.10^{-4}}$$

$$|\text{thit}| = 6875,19$$

t tabel = 2,093

C – G

$$Sp^2 = \frac{16(0,000303)^2 + 0}{17+1-2}$$

$$Sp^2 = 9,1.10^{-8}$$

$$Sp = 0,000303$$

$$|\text{thit}| = \frac{2,312}{3,117.10^{-4}}$$

$$|\text{thit}| = 7417,39$$

t tabel = 2,120

D – E

$$Sp^2 = \frac{5(0,000857)^2 + 3(0,0015)^2}{6+4-2}$$

$$Sp^2 = 1,302.10^{-6}$$

$$Sp = 0,000303$$

$$|\text{thit}| = \frac{0,928}{7,365.10^{-4}}$$

$$|\text{thit}| = 1260,01$$

t tabel = 2,306

D – F

$$Sp^2 = \frac{5(0,000857)^2 + 3(0,001309)^2}{6+4-2}$$

$$Sp^2 = 1,101.10^{-6}$$

$$Sp = 0,0001049$$

$$|\text{thit}| = \frac{1,298}{6,772.10^{-4}}$$

$$|\text{thit}| = 1916,72$$

t tabel = 2,306

D – G

$$Sp^2 = \frac{5(0,000857)^2 + (0)}{6+1-2}$$

$$Sp^2 = 7,34.10^{-6}$$

$$Sp = 0,0008569$$

$$|\text{thit}| = \frac{1,357}{9,256.10^{-4}}$$

$$|\text{thit}| = 1466,08$$

t tabel = 2,571

E – F

$$Sp^2 = \frac{3(0,0015)^2 + 3(0,001309)^2}{4+4-2}$$

$$Sp^2 = 1,981.10^{-6}$$

$$Sp = 0,001408$$

$$|\text{thit}| = \frac{0,37}{9,956.10^{-4}}$$

$|\text{thit}| = 371,63$

T tabel $= 2,447$

E – G

$$Sp^2 = \frac{3(0,0015)^2 + (0)}{4 + 4 - 2}$$

$Sp^2 = 2,25.10^{-6}$

$Sp = 0,0015$

$$|\text{thit}| = \frac{0,429}{2,677.10^{-3}}$$

$|\text{thit}| = 255,81$

t tabel $= 3,183$

F – G

$$Sp^2 = \frac{3(0,001309)^2 + (0)}{4 + 1 - 2}$$

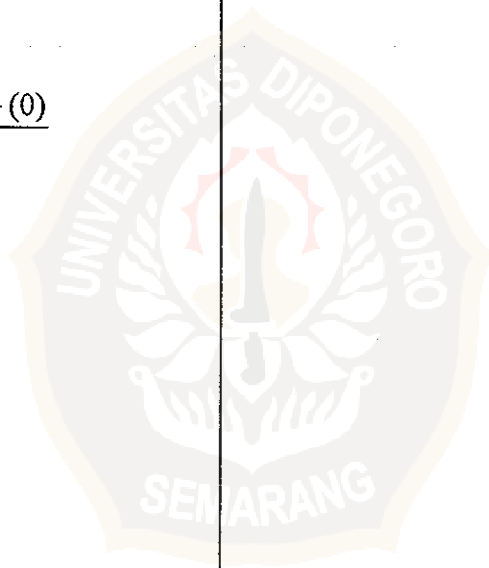$Sp^2 = 1,713.10^{-6}$

$Sp = 0,0013$

$$|\text{thit}| = \frac{0,059}{1,453.10^{-3}}$$

$|\text{thit}| = 40,60$

t tabel $= 3,183$

2) Pekerja jalanan

A – B

$$Sp^2 = \frac{22(0,000541)^2 + 3(0,001309)^2}{23 + 4 - 2}$$

$Sp^2 = 4,63.10^{-7}$

$Sp = 0,0006806$

$$|thit| = \frac{1,572}{6,806.10^{-4}}$$

$|thit| = 2309,73$

t tabel = 2,060

A – C

$$Sp^2 = \frac{22(0,000541)^2 + 1(0,002846)^2}{23 + 2 - 2}$$

$Sp^2 = 6,32.10^{-7}$

$Sp = 0,0007950$

$$|thit| = \frac{2,211}{7,950.10^{-4}}$$

$|thit| = 2781,13$

t tabel = 2,060

A – E

$$Sp^2 = \frac{22(0,000541)^2 + 5(0,001630)^2}{23 + 6 - 2}$$

$Sp^2 = 7,305.10^{-7}$

$Sp = 0,0008547$

$$|thit| = \frac{2,269}{8,547.10^{-4}}$$

$|thit| = 2654,73$

t tabel = 2,052

A – F

$$Sp^2 = \frac{22(0,000541)^2 + 2(0,001652)^2}{23 + 3 - 2}$$

$Sp^2 = 4,96.10^{-7}$

$Sp = 0,000704$

$$|thit| = \frac{4,204}{7,04.10^{-4}}$$

$|thit| = 5971,59$

t tabel = 2,064

B – C

$$Sp^2 = \frac{3(0,001732)^2 + 1(0,002846)^2}{4 + 2 - 2}$$

$Sp^2 = 3,310.10^{-6}$

$Sp = 0,001819$

$$|thit| = \frac{0,639}{1,819.10^{-3}}$$

$|thit| = 351,29$

t tabel = 2,776

B – E

$$Sp^2 = \frac{3(0,001309)^2 + 5(0,001630)^2}{4 + 6 - 2}$$

$Sp^2 = 2,303.10^{-6}$

$Sp = 0,001517$

$$|thit| = \frac{0,697}{1,517.10^{-3}}$$

$|\text{thit}| = 459,46$

t tabel $= 2,306$

B – F

$$Sp^2 = \frac{3(0,001732)^2 + 2(0,001652)^2}{4+3-2}$$

$Sp^2 = 2,891. \ 10^{-6}$

$Sp = 0,001700$

$$|\text{thit}| = \frac{2,413}{1,298.10^{-3}}$$

$|\text{thit}| = 1859,01$

t tabel $= 2,571$

C – E

$$Sp^2 = \frac{1(0,002846)^2 + 5(0,001630)^2}{2+6-2}$$

$Sp^2 = 3,563. \ 10^{-6}$

$Sp = 0,001887$

$$|\text{thit}| = \frac{0,058}{1,541.10^{-3}}$$

$|\text{thit}| = 3763$

t tabel $= 2,447$

C – F

$$Sp^2 = \frac{1(0,002846)^2 + 2(0,001652)^2}{2+3-2}$$

$Sp^2 = 4,519. \ 10^{-6}$

$Sp = 0,002126$

$$|\text{thit}| = \frac{1,993}{1,940.10^{-3}}$$

$|\text{thit}| = 1027,32$

t tabel $= 3,183$

E – F
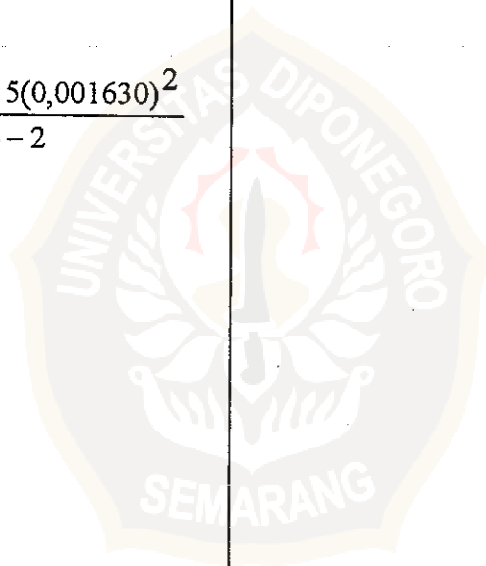
$$Sp^2 = \frac{5(0,001630)^2 + 2(0,001652)^2}{6+3-2}$$

$Sp^2 = 2,676. \ 10^{-6}$

$Sp = 0,001636$

$$|\text{thit}| = \frac{1,935}{1,156.10^{-3}}$$

$|\text{thit}| = 1673,88$

t tabel $= 2,365$

Lampiran C4

Tabel. Perhitungan Analisis Regresi Linier Ganda Hubungan Antara Usia, Lama Bekerja dan Kadar Pb Dalam Rambut Pekerja Jalanan

x_0	x_1	x_2	y	x_1x_2	x_1^2	x_2^2	x_1y	x_2y	y^2
1	20	1	0.972	20	400	1	19.44	0.972	0.944784
1	22	3	1.345	66	484	9	29.59	4.035	1.809025
1	22	3	1.949	66	484	9	42.878	5.847	3.798601
1	22	1.5	1.291	33	484	2.25	28.402	1.9365	1.666681
1	22	5	2.138	110	484	25	47.036	10.69	4.571044
1	22	2	1.429	44	484	4	31.438	2.858	2.042041
1	23	1.5	1.798	34.5	529	2.25	41.354	2.697	3.232804
1	23	3	1.972	69	529	9	45.356	5.916	3.888784
1	24	2.5	1.647	60	576	6.25	39.528	4.1175	2.712609
1	25	2	1.347	50	625	4	33.675	2.694	1.814409
1	25	5	1.961	125	625	25	49.025	9.805	3.845521
1	25	5	2.305	125	625	25	57.625	11.525	5.313025
1	27	10	3.837	270	729	100	103.599	38.37	14.72257
1	28	6	3.101	168	784	36	86.828	18.606	9.616201
1	29	1	0.837	29	841	1	24.273	0.837	0.700569
1	29	9	3.389	261	841	81	98.281	30.501	11.48532
1	35	5	2.381	175	1225	25	83.335	11.905	5.669161
1	36	1	1.107	36	1296	1	39.852	1.107	1.225449
1	36	5	2.265	180	1296	25	81.54	11.325	5.130225
1	38	12	3.819	456	1444	144	145.122	45.828	14.58476
1	39	15	4.089	585	1521	225	159.471	61.335	16.71992
1	39	9	3.171	351	1521	81	123.669	28.539	10.05524
1	43	6	3.32	258	1849	36	142.76	19.92	11.0224
1	47	7	2.827	329	2209	49	132.869	19.789	7.991929
1	48	30	4.334	1440	2304	900	208.032	130.02	18.78356
1	49	4	2.327	196	2401	16	114.023	9.308	5.414929
1	50	6	3.009	300	2500	36	150.45	18.054	9.054081
1	50	20	4.222	1000	2500	400	211.1	84.44	17.82528
1	55	30	3.936	1650	3025	900	216.48	118.08	15.4921
1	55	39	4.979	2145	3025	1521	273.845	194.181	24.79044
1	57	30	3.756	1710	3249	900	214.092	112.68	14.10754
1	58	33	4.637	1914	3364	1089	268.946	153.021	21.50177
1	60	35	4.76	2100	3600	1225	285.6	166.6	22.6576
1	60	30	4.598	1800	3600	900	275.88	137.94	21.1416
1	60	6	9.551	360	3600	36	573.06	57.306	91.2216
1	63	7	2.949	441	3969	49	185.787	20.643	8.696601
1	64	38	6.635	2432	4096	1444	424.64	252.13	44.02323
1	65	40	3.969	2600	4225	1600	257.985	158.76	15.75296
38	1495	468.5	117.959	23989	67343	11942	5346.87	1964.32	475.0264

Perhitungan regresi linier ganda untuk pekerja jalanan:

$$x'x = \begin{pmatrix} 38 & 1495 & 468.5 \\ 1495 & 67343 & 23988.5 \\ 468.5 & 23988.5 & 11941.75 \end{pmatrix} \qquad x'y = \begin{pmatrix} 117.959 \\ 5346.866 \\ 1964.318 \end{pmatrix}$$

$$\det(x'x) = 824389486 \qquad\qquad y'y = 475.0264$$

$$(x'x)^{-1} = \begin{pmatrix} 0.2774722 & -0.00802 & 0.005231 \\ -0.008023 & 0.000284 & -0.00026 \\ 0.005231 & -0.00026 & 0.000393 \end{pmatrix}$$

$$\text{yrat} = 3.104184$$
$$\text{nyrat2} = 317.9867$$

$$b = (x'x)^{-1}(x'y) = \begin{pmatrix} 0.1068572 \\ 0.0700479 \\ 0.0195878 \end{pmatrix}$$

$$b'x'y = 425.61792$$

JKR =	107.63125	KTR =	53.81562
JKS =	49.408443	KTS =	1.646948
JKT =	157.03969	F_0 =	32.67597

$$R^2 = 0.6853761$$

$$s^2(b_i) = \begin{pmatrix} 0.456982 & -0.013214 & 0.008616 \\ -0.01321 & 0.0004681 & -0.00042 \\ 0.008616 & -0.00042 & 0.000647 \end{pmatrix}$$

$$s(b_0) = 0.676005$$
$$s(b_1) = 0.021635$$
$$s(b_2) = 0.025442$$

$$t(b_0) = 0.158072$$
$$t(b_1) = 3.237728$$
$$T(b_2) = 0.769897$$
$$t_{tabel} = 1.695$$

Karena $t(b_1) > t_{tabel}$ maka H_0 ditolak berarti terdapat hubungan linier antara usia dengan kadar Pb dalam rambut pekerja jalanan, sedangkan $t(b_2) < t_{tabel}$ maka H_0 diterima berarti tidak terdapat hubungan linier antara lama bekerja dengan kadar Pb dalam rambut.

Lampiran C5.

Tabel. Perhitungan Analisis Regresi Linier Ganda Hubungan Antara Usia. Lama Bekerja dan Kadar Pb Dalam Rambut Petani

x_0	x_1	x_2	y	x_1x_2	x_1^2	x_2^2	x_1y	x_2y	y^2
1	22	8	0,323	176	484	64	7,106	2,584	0,104329
1	26	15	0,374	390	676	225	9,724	5,61	0,139876
1	27	15	0,602	405	729	225	16,254	9,03	0,362404
1	28	15	0,542	420	784	225	15,176	8,13	0,293764
1	29	15	0,442	435	841	225	12,818	6,63	0,195364
1	30	20	0,618	600	900	400	18,54	12,36	0,381924
1	30	15	0,515	450	900	225	15,45	7,725	0,265225
1	32	20	0,631	640	1024	400	20,192	12,62	0,398161
1	32	20	0,714	640	1024	400	22,848	14,28	0,509796
1	33	20	4,4	660	1089	400	145,2	88	19,36
1	35	21	1,671	735	1225	441	58,485	35,091	2,792241
1	35	20	0,719	700	1225	400	25,165	14,38	0,516961
1	35	20	0,946	700	1225	400	33,11	18,92	0,894916
1	35	20	1,589	700	1225	400	55,615	31,78	2,524921
1	38	22	1,676	836	1444	484	63,688	36,872	2,808976
1	40	25	1,851	1000	1600	625	74,04	46,275	3,426201
1	40	20	0,881	800	1600	400	35,24	17,62	0,776161
1	40	20	0,902	800	1600	400	36,08	18,04	0,813604
1	40	15	1,338	600	1600	225	53,52	20,07	1,790244
1	43	22	0,998	946	1849	484	42,914	21,956	0,996004
1	45	22	1,772	990	2025	484	79,74	38,984	3,139984
1	45	25	1,994	1125	2025	625	89,73	49,85	3,976036
1	48	30	2,866	1440	2304	900	137,568	85,98	8,213956
1	48	25	1,913	1200	2304	625	91,824	47,825	3,659569
1	49	20	1,251	980	2401	400	61,299	25,02	1,565001
1	50	30	2,486	1500	2500	900	124,3	74,58	6,180196
1	50	35	2,409	1750	2500	1225	120,45	84,315	5,803281
1	55	34	2,726	1870	3025	1156	149,93	92,684	7,431076
1	60	40	3,057	2400	3600	1600	183,42	122,28	9,345249
1	60	40	3,02	2400	3600	1600	181,2	120,8	9,1204
1	64	44	3,05	2816	4096	1936	195,2	134,2	9,3025
1	69	40	2,913	2760	4761	1600	200,997	116,52	8,485569
1	69	40	2,892	2760	4761	1600	199,548	115,68	8,363664
33	1382	793	54,081	36624	62946	21699	2576,37	1536,7	123,937553

Perhitungan regresi linier ganda untuk petani:

$$x'x = \begin{pmatrix} 33 & 1382 & 793 \\ 1382 & 62946 & 36624 \\ 793 & 36624 & 21699 \end{pmatrix} \qquad x'y = \begin{pmatrix} 54.081 \\ 2576.371 \\ 1536.691 \end{pmatrix}$$

$$\det(x'x) = 57497592 \qquad\qquad y'y = 123.9376$$

$$(x'x)^{-1} = \begin{pmatrix} 0.426937 & -0.016439 & 0.012143 \\ -0.016439 & 0.001517 & -0.001959 \\ 0.012143 & -0.001959 & 0.00291 \end{pmatrix}$$

yrat = 1.638818
nyrat2 = 88.62893

$$b = (x'x)^{-1}(x'y) = \begin{pmatrix} -0.603046 \\ 0.007939 \\ 0.079457 \end{pmatrix}$$

$$B'x'y = 109.9421$$

JKR =	21.31319	KTR =	10.6566
JKS =	13.99544	KTS =	0.466515
JKT =	35.30863	F_0 =	22.84301

$$R^2 = 0.603626$$

$$s^2(b_i) = \begin{pmatrix} 0.199173 & -0.007669 & 0.005665 \\ -0.007669 & 0.000708 & -0.000914 \\ 0.005665 & -0.000914 & 0.001357 \end{pmatrix}$$

$s(b_0) = 0.446288$
$s(b_1) = 0.026602$
$s(b_2) = 0.036842$

$t(b_0) = -1.351251$
$t(b_1) = 0.298452$
$t(b_2) = 2.156671$
$t_{tabel} = 1.7$

Karena $t(b_1) < t_{tabel}$ maka H_0 diterima berarti tidak terdapat hubungan linier antara usia dengan kadar Pb dalam rambut petani, sedangkan $t(b_2) > t_{tabel}$ maka H_0 ditolak berarti terdapat hubungan linier antara lama bekerja dengan kadar Pb dalam rambut.

Lampiran C6

Tabel. Perhitungan Analisis Regresi Linier Ganda Hubungan Antara Usia, Lama Bekerja ($\leq$ 20 tahun) dan Kadar Pb Dalam Rambut Pekerja Jalanan

x_0	x_1	x_2	y	x_1x_2	x_1^2	x_2^2	x_1y	x_2y	y^2
1	20	1	0.972	20	400	1	19.44	0.972	0.944784
1	22	3	1.345	66	484	9	29.59	4.035	1.809025
1	22	3	1.949	66	484	9	42.878	5.847	3.798601
1	22	1.5	1.291	33	484	2.25	28.402	1.9365	1.666681
1	22	5	2.138	110	484	25	47.036	10.69	4.571044
1	22	2	1.429	44	484	4	31.438	2.858	2.042041
1	23	1.5	1.798	34.5	529	2.25	41.354	2.697	3.232804
1	23	3	1.972	69	529	9	45.356	5.916	3.888784
1	24	2.5	1.647	60	576	6.25	39.528	4.1175	2.712609
1	25	2	1.347	50	625	4	33.675	2.694	1.814409
1	25	5	1.961	125	625	25	49.025	9.805	3.845521
1	25	5	2.305	125	625	25	57.625	11.525	5.313025
1	27	10	3.837	270	729	100	103.599	38.37	14.72257
1	28	6	3.101	168	784	36	86.828	18.606	9.616201
1	29	1	0.837	29	841	1	24.273	0.837	0.700569
1	29	9	3.389	261	841	81	98.281	30.501	11.48532
1	35	5	2.381	175	1225	25	83.335	11.905	5.669161
1	36	1	1.107	36	1296	1	39.852	1.107	1.225449
1	36	5	2.265	180	1296	25	81.54	11.325	5.130225
1	38	12	3.819	456	1444	144	145.122	45.828	14.58476
1	39	15	4.089	585	1521	225	159.471	61.335	16.71992
1	39	9	3.171	351	1521	81	123.669	28.539	10.05524
1	43	6	3.32	258	1849	36	142.76	19.92	11.0224
1	47	7	2.827	329	2209	49	132.869	19.789	7.991929
1	49	4	2.327	196	2401	16	114.023	9.308	5.414929
1	50	6	3.009	300	2500	36	150.45	18.054	9.054081
1	50	20	4.222	1000	2500	400	211.1	84.44	17.82528
1	60	6	9.551	360	3600	36	573.06	57.306	91.2216
1	63	7	2.949	441	3969	49	185.787	20.643	8.696601
29	973	163.5	76.355	6197.5	36855	1462.8	2921.37	540.906	276.7756

Perhitungan regresi linier ganda untuk pekerja jalanan dengan lama bekerja ≤ 20 tahun:

$$x'x = \begin{pmatrix} 29 & 973 & 163.5 \\ 973 & 36855 & 6197.5 \\ 163.5 & 6197.5 & 1462.75 \end{pmatrix} \qquad x'y = \begin{pmatrix} \text{-}76.355 \\ 2921.366 \\ 540.906 \end{pmatrix}$$

$\det(x'x) = \quad 51338559$

$y'y = 276.775571$

$$(x'x)^{-1} = \begin{pmatrix} 0.3019299 & \text{-}0.0079855 & 8.522\text{E-}05 \\ \text{-}0.007986 & 0.00030557 & \text{-}0.0004021 \\ 8.522\text{E-}05 & \text{-}0.0004021 & 0.0023777 \end{pmatrix}$$

yrat = 2.632931034
nyrat2 = 228.7667525

$$b = (x'x)^{-1}(x'y) = \begin{pmatrix} \text{-}0.228642 \\ 0.0654617 \\ 0.1179902 \end{pmatrix}$$

$b'x'y = \quad 237.60119$

JKR =	8.8344366	KTR =	4.41721828
JKS =	39.174382	KTS =	1.30581273
JKT =	48.008819	F_0 =	3.38273488

$R^2 = \quad 0.184017$

$$s^2(b_i) = \begin{pmatrix} 0.39426 & \text{-}0.010428 & 0.00011128 \\ \text{-}0.0104 & 0.000399 & \text{-}0.000525 \\ 0.00011 & \text{-}0.000525 & 0.00310479 \end{pmatrix}$$

$s(b_0) = \quad 0.6279$
$s(b_1) = 0.01998$
$s(b_2) = 0.05572$

$t(b_0) = \quad \text{-}0.3641$
$t(b_1) = \quad 3.27711$
$t(b_2) = \quad 2.11753$
$t_{tabel} = \quad 1.7$

Karena $t(b_1) > t_{tabel}$ maka H_0 ditolak berarti terdapat hubungan linier antara usia dengan kadar Pb dalam rambut pekerja jalanan, sedangkan $t(b_2) > t_{tabel}$ maka H_0 juga ditolak berarti juga terdapat hubungan linier antara lama bekerja dengan kadar Pb dalam rambut.
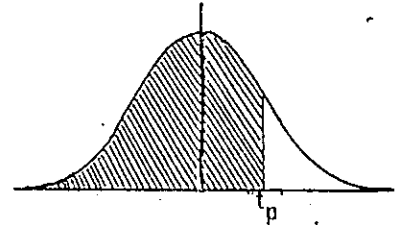
LAMPIRAN D

LAIN - LAIN

Lampiran D1.

, AR B

,Nilai Persentil
Untuk Distribusi t
ν := dk
(Bilangan Dalam Badan Daftar Menyatakan t_p)

ν	$t_{0,995}$	$t_{0,99}$	$t_{0,975}$	$t_{0,95}$	$t_{0,90}$	$t_{0,80}$	$t_{0,75}$	$t_{0,70}$	$t_{0,60}$	$t_{0,55}$
1	63,66	31,82	12,71	6,31	3,08	1,376	1,000	0,727	0,325	0,158
2	9,92	6,96	4,30	2,92	1,89	1,061	0,816	0,617	0,289	0,142
3	5,84	4,54	3,18	2,35	1,64	0,978	0,765	0,584	0,277	0,137
4	4,60	3,75	2,78	2,13	1,53	0,941	0,741	0,569	0,271	0,134
5	4,03	3,36	2,75	2,02	1,48	0,920	0,727	0,559	0,267	0,132
6	3,71	3,14	2,45	1,94	1,44	0,906	0,718	0,553	0,265	0,131
7	3,50	3,00	2,36	1,90	1,42	0,896	0,711	0,549	0,263	0,130
8	3,36	2,90	2,31	1,86	1,40	0,889	0,706	0,546	0,262	0,130
9	3,25	2,82	2,26	1,83	1,38	0,883	0,703	0,543	0,261	0,129
10	3,17	2,76	2,23	1,81	1,37	0,879	0,700	0,542	0,260	0,129
11	3,11	2,72	2,20	1,80	1,36	0,876	0,697	0,540	0,260	0,129
12	3,06	2,68	2,18	1,78	1,36	0,873	0,695	0,539	0,259	0,128
13	3,01	2,65	2,16	1,77	1,35	0,870	0,694	0,538	0,259	0,128
14	2,98	2,62	2,14	1,76	1,34	0,868	0,692	0,537	0,258	0,128
15	2,95	2,60	2,13	1,75	1,34	0,866	0,691	0,536	0,258	0,128
16	2,92	2,58	2,12	1,75	1,34	0,865	0,690	0,535	0,258	0,128
17	2,90	2,57	2,11	1,74	1,33	0,863	0,689	0,534	0,257	0,128
18	2,88	2,55	2,10	1,73	1,33	0,862	0,688	0,534	0,257	0,127
19	2,86	2,54	2,09	1,73	1,33	0,861	0,688	0,533	0,257	0,127
20	2,84	2,53	2,09	1,72	1,32	0,860	0,687	0,533	0,257	0,127
21	2,83	2,52	2,08	1,72	1,32	0,859	0,686	0,532	0,257	0,127
22	2,82	2,51	2,07	1,72	1,32	0,858	0,686	0,532	0,256	0,127
23	2,81	2,50	2,07	1,71	1,32	0,858	0,685	0,532	0,256	0,127
24	2,80	2,49	2,06	1,71	1,32	0,857	0,685	0,531	0,256	0,127
25	2,79	2,48	2,06	1,71	1,32	0,856	0,684	0,531	0,256	0,127
26	2,78	2,48	2,06	1,71	1,32	0,856	0,684	0,531	0,256	0,127
27	2,77	2,47	2,05	1,70	1,31	0,855	0,684	0,531	0,256	0,127
28	2,76	2,47	2,05	1,70	1,31	0,855	0,683	0,530	0,256	0,127
29	2,76	2,46	2,04	1,70	1,31	0,854	0,683	0,530	0,256	0,127
30	2,75	2,46	2,04	1,70	1,31	0,854	0,683	0,530	0,256	0,127
40	2,70	2,42	2,02	1,68	1,30	0,851	0,681	0,529	0,255	0,126
60	2,66	2,39	2,00	1,67	1,30	0,848	0,679	0,527	0,254	0,126
120	2,62	2,36	1,98	1,66	1,29	0,845	0,677	0,526	0,254	0,126
∞	2,58	2,33	1,96	1,645	1,28	0,842	0,674	0,534	0,253	0,126

Sumber: Metoda Statistika, DR.Sudjana, M.A.,M.Sc., Tarsito, Bandung, 1982

Lampiran D2.

LAMPIRAN: VIb

Tabel 6b. Nilai F. 05†

Derajat kebebasan untuk pembilang

	1	2	3	4	5	6	7	8	9	10	12	15	20	24	30	40	60	120	∞
1	161	200	216	225	230	234	237	239	241	242	244	246	248	249	250	251	252	253	254
2	18.5	19.0	19.2	19.2	19.3	19.3	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.5	19.5	19.5	19.5	19.5	19.5
3	10.1	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81	8.79	8.74	8.70	8.66	8.64	8.62	8.59	8.57	8.55	8.53
4	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00	5.96	5.91	5.86	5.80	5.77	5.75	5.72	5.69	5.66	5.63
5	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77	4.74	4.68	4.62	4.56	4.53	4.50	4.46	4.43	4.40	4.37
6	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10	4.06	4.00	3.94	3.87	3.84	3.81	3.77	3.74	3.70	3.67
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68	3.64	3.57	3.51	3.44	3.41	3.38	3.34	3.30	3.27	3.23
8	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39	3.35	3.28	3.22	3.15	3.12	3.08	3.04	3.01	2.97	2.93
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18	3.14	3.07	3.01	2.94	2.90	2.86	2.83	2.79	2.75	2.71
10	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02	2.98	2.91	2.85	2.77	2.74	2.70	2.66	2.62	2.58	2.54
11	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90	2.85	2.79	2.72	2.65	2.61	2.57	2.53	2.49	2.45	2.40
12	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80	2.75	2.69	2.62	2.54	2.51	2.47	2.43	2.38	2.34	2.30
13	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71	2.67	2.60	2.53	2.46	2.42	2.38	2.34	2.30	2.25	2.21
14	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65	2.60	2.53	2.46	2.39	2.35	2.31	2.27	2.22	2.18	2.13
15	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59	2.54	2.48	2.40	2.33	2.29	2.25	2.20	2.16	2.11	2.07
16	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54	2.49	2.42	2.35	2.28	2.24	2.19	2.15	2.11	2.06	2.01
17	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49	2.45	2.38	2.31	2.23	2.19	2.15	2.10	2.06	2.01	1.96
18	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46	2.41	2.34	2.27	2.19	2.15	2.11	2.06	2.02	1.97	1.92
19	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42	2.38	2.31	2.23	2.16	2.11	2.07	2.03	1.98	1.93	1.88
20	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39	2.35	2.28	2.20	2.12	2.08	2.04	1.99	1.95	1.90	1.84
21	4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37	2.32	2.25	2.18	2.10	2.05	2.01	1.96	1.92	1.87	1.81
22	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34	2.30	2.23	2.15	2.07	2.03	1.98	1.94	1.89	1.84	1.78
23	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32	2.27	2.20	2.13	2.05	2.01	1.96	1.91	1.86	1.81	1.76
24	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30	2.25	2.18	2.11	2.03	1.98	1.94	1.89	1.84	1.79	1.73
25	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28	2.24	2.16	2.09	2.01	1.96	1.92	1.87	1.82	1.77	1.71
30	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21	2.16	2.09	2.01	1.93	1.89	1.84	1.79	1.74	1.68	1.62
40	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12	2.08	2.00	1.92	1.84	1.79	1.74	1.69	1.64	1.58	1.51
60	4.00	3.15	2.76	2.53	2.37	2.25	2.17	2.10	2.04	1.99	1.92	1.84	1.75	1.70	1.65	1.59	1.53	1.47	1.39
120	3.92	3.07	2.68	2.45	2.29	2.18	2.09	2.02	1.96	1.91	1.83	1.75	1.66	1.61	1.55	1.50	1.43	1.35	1.25
∞	3.84	3.00	2.60	2.37	2.21	2.10	2.01	1.94	1.88	.83	1.75	1.67	1.57	1.52	1.46	1.39	1.32	1.22	1.00

†Tabel ini dikutip dari M. Merrington and C.M. Thompson, "Tables of percentage points of the inverted beta (F) distribusion," *Biometrika*, Vol. 33 (1943).

Lampiran D3.

National Institute of Standards & Technology
Certificate of Analysis

Standard Reference Material 1577b
Bovine Liver

Standard Reference Material (SRM) is intended primarily for use as a control material and in evaluating analytical ods for the determination of major, minor, and trace elements in animal tissue and other biological matrices.

ied Values of Constituent Elements: The certified values for the constituent elements are given in Table 1. Cer-values are based on results obtained by definitive methods of known accuracy; or alternatively, from results ob-by two or more independent analytical methods. Noncertified values are provided for information only in Table 2. ical methods used for the analysis of SRM 1577b, including certified and information values, are given in Table 3.

and Warnings to Users

tion of Certification: This certification is invalid after 5 years from the date of purchase and shipment from NIST. any of the certified constituents change within a 5-year period purchasers will be notified by NIST.

x The SRM should be kept in its original bottle and stored between 10-30 °C. It should not be exposed to in-urces of radiation. The bottle should be kept tightly closed and stored in a desiccator away from direct sunlight.

minimum sample of 250 mg of the dried material (see Instructions for Drying) should be used for any analytical nation to be related to the certified values of this Certificate.

ion procedures should be designed to effect complete solution, but without losses of volatile elements, such as '. Dissolution for these determinations should be carried out in a closed system.

al consultation was provided by S.B. Schiller of the Statistical Engineering Division.

all direction and coordination of the analyses leading to this certification were under the chairmanship of J.R. Chief of the Inorganic Analytical Research Division.

nical and support aspects involved in the preparation, certification, and issuance of this Standard Reference were coordinated through the Standard Reference Materials Program by T.E. Gills.

urg, MD 20899
', 1991

William P. Reed, Chief
Standard Reference Materials Program

(over)

Table 1. Certified Values of Constituent Elements

Element	Content (wt. percent)
Chlorine	0.278 ± 0.006
Phosphorus	1.10 ± 0.03
Potassium	0.994 ± 0.002
Sodium	0.242 ± 0.006
Sulfur	0.785 ± 0.006

Element	Content ($\mu g/g$)		Element	Content ($\mu g/g$)
Cadmium	0.50 ±	0.03	Molybdenum	3.5 ± 0.3
Calcium	116 ±	4	Rubidium	13.7 ± 1.1
Copper	160 ±	8	Selenium	0.73 ± 0.06
Iron	184 ±	15	Silver	0.039 ± 0.007
Lead	0.129 ±	0.004 ✓	Strontium	0.136 ± 0.001
Magnesium	601 ±	28	Zinc	127 ± 16
Manganese	10.5 ±	1.7		

The estimated uncertainty of a certified value is the sum of the half-width of a 95% confidence interval for the mean of results and an allowance for systematic error, except for the uncertainty associated with sulfur which is based on scientific judgment and is roughly equivalent to one percent of the certified value. The systematic error is estimated by the maximum absolute deviation between a single method mean and the grand mean. The grand mean was computed using the weighting scheme of Paule and Mandel (NBS Journal of Research 87, pp 377-385).

Table 2. Noncertified Values of Constituent Elements

Element	Content (wt. percent)
Nitrogen	(10.6)

Element	Content ($\mu g/g$)	Element	Content ($\mu g/g$)
Arsenic	(0.05)	Cobalt	(0.25)
Aluminum	(3)	Vanadium	(0.123)
Antimony	(0.003)		
Bromine	(9.7)		
Mercury	(0.003)		

Instructions for Drying: Samples of this SRM must be dried before weighing according to the following procedure: Dry for 24 hours at 20 to 25 °C in a vacuum oven at a pressure not greater than 30 Pa (0.2 mm Hg).

Source and Preparation of Material:

The bovine liver for this standard was obtained in the Portland, Oregon area. The gross fat, major blood vessels, and "skin" were removed and the liver was ground. The ground liver was then mixed, transferred to polyethylene-lined trays, and lyophilized by Oregon Freeze Dry Foods, Inc., Albany, Oregon. After lyophilization, the liver was powdered in a Tornado mill, packaged in moisture-proof bags, and then transported to the National Institute of Standards and Technology.

Table 3.

Analytical Methods Used for the Analysis of SRM 1577b

Method	Elements Determined
ETAAS	Ag, Cd, As, Co
FES	Ca, Na, Sr
ICP	Ca, Cu, Fe, Mg, Mn, Zn, Sr
GFAAS	Cu, Mn, Rb, Zn
DCP	P
IC	Cl, S
IDTIMS	K, Pb, Rb, S, Sr
IDSSMS	Cd, Cu, Mo, Se, Zn
INAA	Cl, Cu, Fe, Mn, Na, Rb, Se, Zn, Al, Br, Co, K, V, Mg, Ag
RNAA	Ag, As, Cd, Cu, Hg, Mo, Se, Sb
POL	Fe
Color	P
Kjeldahl	N
CVAAS	Hg
FAAS	Ca, Mg

ETAAS: Electrothermal atomic absorption spectrometry
FES: Flame atomic emission spectrometry
ICP: Inductively coupled plasma emission spectrometry
GFAAS: Graphite furnace atomic absorption spectrometry
DCP: Direct current plasma emission spectrometry
IC: Ion chromatography
IDTIMS: Isotope dilution thermal ionization mass spectrometry
IDSSMS: Isotope dilution spark source mass spectrometry
INAA: Instrumental neutron activation analysis
RNAA: Radiochemical neutron activation analysis
POL: Polarography
Color: Spectrophotometry
Kjeldahl: Titrimetry
CVAAS: Cold Vapor Atomic Absorption Spectrometry
FAAS: Flame Atomic Absorption Spectrometry

Analysts:

Analytical Chemistry Division, National Institute of Standards & Technology:

1. J.V. Bailey
2. I.L. Barnes
3. E.S. Beary
4. C.G. Blundell
5. K.A. Brletic
6. T.A. Butler
7. E.R. Deardorff
8. M.S. Epstein
9. J.W. Gramlich
10. R.R. Greenberg
11. S. Hanamura
12. S.H. Harrison
13. E.F. Heald
14. W.R. Kelly
15. H.M. Kingston
16. W.F. Koch
17. G.M. Lambert
18. R.M. Lindstrom
19. G.J. Lutz
20. L.A. Machlan
21. E.J. Maienthal
22. T.J. Murphy
23. P.J. Paulsen
24. L.J. Powell
25. T.C. Rains
26. T.A. Rush
27. R.L. Watters, Jr.
28. R. Zeisler

Cooperating Analysts:

30. M. Gallorini and E. Orvini, Consiglio Nazionale delle Ricerche, Centro di Radiochimica e Analisi per Attivazione presso l' Instituto di Chimica Generale dell'Universita, Pavia, Italy.

31. L. Kosta, A.R. Byrne, M. Dermelj, Institute "Josef Stefan", Ljubljana, Yugoslavia.

Lampiran D4.

Foto – foto alat Spektrofotometer Serapan Atom