

LAMPIRAN A DATA PENGAMATAN

Table A 1. Data Rendemen

Sampel	Waktu Perendaman (jam)	Penentuan Rendemen		
		Berat Tulang Segar (gr)	Berat Gelatin Kering (gr)	Rendemen (%)
Gelatin (Menggunakan H ₃ PO ₄ 4%)	24	100	7,9664	7,9
	36	100	7,7144	7,7
	48	100	6,8223	6,8
	60	100	7,1039	7,1
Gelatin (Menggunakan H ₃ PO ₄ 6%)	24	100	8,5527	8,5
	36	100	6,9333	6,9
	48	100	6,6925	6,6
	60	100	7,0676	7,0

Table A 2. Data Kadar Air

Sampel	Waktu Perendaman (jam)	Penentuan Kadar Air				Kadar Air (%)
		Berat Crusible Kosong (gr)	Berat Sampel (gr)	Berat Crusible+Sampel Sebelum (gr)	Berat Crusible+Sampel Sesudah (gr)	
Gelatin (Menggunakan H ₃ PO ₄ 4%)	24	78,0812	1,0	79,0866	78,9775	10,91
	36	58,7984	1,0	59,8074	59,7047	10,27
	48	74,0589	1,0	75,0692	74,9865	8,27
	60	78,0504	1,0	79,0515	78,9742	7,73
Gelatin (Menggunakan H ₃ PO ₄ 6%)	24	75,8977	1,0	76,7927	76,6848	10,79
	36	74,0898	1,0	75,0805	74,9885	9,2
	48	75,7833	1,0	76,7857	76,6984	8,73
	60	58,7821	1,0	59,7861	59,7038	8,23

Table A 3. Data Kadar Abu

Sampel	Waktu Perendaman (jam)	Penentuan Kadar Abu				Kadar Abu (%)
		Berat Crusible Kosong (gr)	Berat Sampel (gr)	Berat Crusible+Sampel Sebelum (gr)	Berat Crusible+Sampel Sesudah (gr)	
Gelatin (Menggunakan H ₃ PO ₄ 4%)	24	25,7192	2,0	27,7192	25,8077	4,42
	36	24,3037	2,0	26,3037	24,4130	5,46
	48	49,2752	2,0	51,2752	49,4001	6,24
	60	37,2911	2,0	39,2911	37,4835	9,62
Gelatin (Menggunakan H ₃ PO ₄ 6%)	24	25,4912	2,0	27,4912	25,5370	2,29
	36	30,3711	2,0	32,3711	30,5136	7,12
	48	44,0689	2,0	46,0689	44,2385	8,48
	60	37,1408	2,0	39,1408	37,3515	10,53

Table A 4. Data pH

Sampel	Waktu	pH
	Perendaman (jam)	
Gelatin (Menggunakan H ₃ PO ₄ 4%)	24	5
	36	4
	48	4,5
	60	5
Gelatin (Menggunakan H ₃ PO ₄ 6%)	24	5
	36	4,5
	48	4,5
	60	5

Data A 5. Data Kekuatan Gel

Sampel	Waktu Perendaman (jam)	Penentuan Kekuatan Gel		
		Peak Load (gr force)	Final Load (gr force)	Kekuatan Gel (Bloom)
Gelatin (Menggunakan H ₃ PO ₄ 4%)	24	483,4	468,2	209,8736
	36	374,4	340,4	167,0589
	48	221,4	194,4	106,9628
	60	127,4	188,0	70,0379
Gelatin (Menggunakan H ₃ PO ₄ 6%)	24	236,0	122,6	112,6966
	36	233,2	161,2	111,5955
	48	121,8	164,0	67,8397
	60	139,0	193,2	74,5945

Tabel A 6. Data Kadar Protein

Sampel	Waktu Perendaman (jam)	Penentuan Kadar Protein		
		Berat Sampel (gr)	Kadar Protein (ppm)	Kadar Protein (%)
Gelatin (Menggunakan H ₃ PO ₄ 4%)	24	1,0	659.380	69,93%
	36	1,0	334.300	55,43%
	48	1,0	549.030	54,90%
	60	1,0	548.140	54,81%
Gelatin (Menggunakan H ₃ PO ₄ 6%)	24	1,0	773.080	77,30%
	36	1,0	572.400	57,24%
	48	1,0	551.760	55,17%
	60	1,0	587.220	58,72%

LAMPIRAN B

URAIAN PERHITUNGAN

1. Perhitungan Kadar Air Gelatin Tulang Ikan Patin dengan Variasi Konsentrasi dan Waktu Perendaman

Rumus :

$$\% \text{ Kadar Air} = \frac{(A-C)}{B} \times 100\%$$

Dimana :

A = Berat cawan kosong + Sampel (Sebelum dioven) (gr)

B = Berat Sampel (gr)

C = Berat Cawan + Sampel (Setelah dioven) (gr)

Dengan menggunakan H₃PO₄ konsentrasi 4%

a. Sampel 1 (24 jam, 4%)

Diketahui : Berat Cawan Kosong + Sampel (A) = 79,0866 gr

Berat Sampel (B) = 1,0 gr

Berat Cawan + Sampel (C) = 78,9775 gr

$$\begin{aligned} \% \text{ Kadar Air} &= \frac{(A-C)}{B} \times 100\% \\ &= \frac{(79,0866-78,9775)}{1,0} \times 100\% \\ &= 10,91\% \end{aligned}$$

b. Sampel 2 (36 jam, 4%)

Diketahui : Berat Cawan Kosong + Sampel (A) = 59,8074 gr

Berat Sampel (B) = 1,0 gr

Berat Cawan + Sampel (C) = 59,7047 gr

$$\begin{aligned} \% \text{ Kadar Air} &= \frac{(A-C)}{B} \times 100\% \\ &= \frac{(59,8074-59,7047)}{1,0} \times 100\% \\ &= 10,27\% \end{aligned}$$

c. Sampel 3 (48 jam, 4%)

Diketahui : Berat Cawan Kosong + Sampel (A) = 75,0692 gr

Berat Sampel (B) = 1,0 gr

Berat Cawan + Sampel (C) = 74,9865 gr

$$\begin{aligned} \% \text{ Kadar Air} &= \frac{(A-C)}{B} \times 100\% \\ &= \frac{(75,0692-74,9865)}{1,0} \times 100\% \\ &= 8,27\% \end{aligned}$$

d. Sampel 4 (60 jam, 4%)

Diketahui : Berat Cawan Kosong + Sampel (A) = 79,0515 gr

Berat Sampel (B) = 1,0 gr

Berat Cawan + Sampel (C) = 78,9742 gr

$$\begin{aligned} \% \text{ Kadar Air} &= \frac{(A-C)}{B} \times 100\% \\ &= \frac{(79,0515-78,9742)}{1,0} \times 100\% \\ &= 7,73\% \end{aligned}$$

Dengan menggunakan H₃PO₄ konsentrasi 6%

e. Sampel 5 (24 jam, 6%)

Diketahui : Berat Cawan Kosong + Sampel (A) = 76,7927 gr

Berat Sampel (B) = 1,0 gr

Berat Cawan + Sampel (C) = 76,6848 gr

$$\begin{aligned} \% \text{ Kadar Air} &= \frac{(A-C)}{B} \times 100\% \\ &= \frac{(76,7927-76,6848)}{1,0} \times 100\% \\ &= 10,79\% \end{aligned}$$

f. Sampel 6 (36 jam, 6%)

Diketahui : Berat Cawan Kosong + Sampel (A) = 75,0805 gr

Berat Sampel (B) = 1,0 gr

Berat Cawan + Sampel (C) = 74,9885 gr

$$\begin{aligned} \% \text{ Kadar Air} &= \frac{(A-C)}{B} \times 100\% \\ &= \frac{(75,0805-74,9885)}{1,0} \times 100\% \\ &= 9,2\% \end{aligned}$$

g. Sampel 7 (48 jam, 6%)

Diketahui : Berat Cawan Kosong + Sampel (A) = 76,7857 gr

Berat Sampel (B) = 1,0 gr

Berat Cawan + Sampel (C) = 76,6984 gr

$$\begin{aligned} \% \text{ Kadar Air} &= \frac{(A-C)}{B} \times 100\% \\ &= \frac{(76,7857-76,6984)}{1,0} \times 100\% \\ &= 8,73\% \end{aligned}$$

h. Sampel 8 (60 jam, 6%)

Diketahui : Berat Cawan Kosong + Sampel (A) = 59,7861gr

Berat Sampel (B) = 1,0 gr

Berat Cawan + Sampel (C) = 59,7038 gr

$$\begin{aligned} \% \text{ Kadar Air} &= \frac{(A-C)}{B} \times 100\% \\ &= \frac{(59,7861-59,7038)}{1,0} \times 100\% \\ &= 8,23\% \end{aligned}$$

2. Perhitungan Kadar Abu Gelatin Tulang Ikan Patin dengan Variasi Konsentrasi dan Waktu Perendaman

Rumus :

$$\% \text{ Kadar Abu} = \frac{(C-A)}{B} \times 100\%$$

Dimana :

A = Berat *crussible* kosong (gr)

B = Berat Sampel (gr)

C = Berat *crussible* + Abu (gr)

Dengan menggunakan H₃PO₄ konsentrasi 4%

a. Sampel 1 (24 jam, 4%)

Diketahui : Berat *crussible* Kosong (A) = 25,7192 gr

Berat Sampel (B) = 1,0 gr

Berat *crussible* + Abu (C) = 25,8077 gr

$$\begin{aligned} \% \text{ Kadar Abu} &= \frac{(C-A)}{B} \times 100\% \\ &= \frac{(25,8077-25,7192)}{2,0} \times 100\% \\ &= 4,42\% \end{aligned}$$

b. Sampel 2 (36 jam, 4%)

Diketahui : Berat *crussible* Kosong (A) = 24,3037 gr

Berat Sampel (B) = 2,0 gr

Berat *crussible* + Abu (C) = 24,4130 gr

$$\begin{aligned} \% \text{ Kadar Abu} &= \frac{(C-A)}{B} \times 100\% \\ &= \frac{(24,4130-24,3037)}{2,0} \times 100\% \\ &= 5,46\% \end{aligned}$$

c. Sampel 3 (48 jam, 4%)

Diketahui : Berat *crussible* Kosong (A) = 49,2752 gr

Berat Sampel (B) = 2,0 gr

Berat *crussible* + Abu (C) = 49,4001 gr

$$\begin{aligned} \% \text{ Kadar Abu} &= \frac{(C-A)}{B} \times 100\% \\ &= \frac{(49,4001-49,2752)}{2,0} \times 100\% \\ &= 6,24\% \end{aligned}$$

d. Sampel 4 (60 jam, 4%)

Diketahui : Berat *crussible* Kosong (A) = 37,2911 gr

Berat Sampel (B) = 2,0 gr

Berat *crussible* + Abu (C) = 37,4835 gr

$$\begin{aligned} \% \text{ Kadar Abu} &= \frac{(C-A)}{B} \times 100\% \\ &= \frac{(37,4835-37,2911)}{2,0} \times 100\% \\ &= 9,62\% \end{aligned}$$

Dengan menggunakan H₃PO₄ konsentrasi 6%

e. Sampel 5 (24 jam, 6%)

Diketahui : Berat *crussible* Kosong (A) = 25,4912 gr

Berat Sampel (B) = 2,0 gr

Berat *crussible* + Abu (C) = 25,5370 gr

$$\begin{aligned} \% \text{ Kadar Abu} &= \frac{(C-A)}{B} \times 100\% \\ &= \frac{(25,5370-25,4912)}{2,0} \times 100\% \\ &= 2,29\% \end{aligned}$$

f. Sampel 6 (36 jam, 6%)

Diketahui : Berat *crussible* Kosong (A) = 30,3711 gr

Berat Sampel (B) = 2,0 gr

Berat *crussible* + Abu (C) = 30,5136 gr

$$\begin{aligned} \% \text{ Kadar Abu} &= \frac{(C-A)}{B} \times 100\% \\ &= \frac{(30,5136-30,3711)}{2,0} \times 100\% \\ &= 7,12\% \end{aligned}$$

g. Sampel 7 (48 jam, 6%)

Diketahui : Berat *crussible* Kosong (A) = 44,0689 gr

Berat Sampel (B) = 2,0 gr

Berat *crussible* + Abu (C) = 44,2385 gr

$$\begin{aligned} \% \text{ Kadar Abu} &= \frac{(C-A)}{B} \times 100\% \\ &= \frac{(44,0689-44,2385)}{2,0} \times 100\% \\ &= 8,48\% \end{aligned}$$

h. Sampel 8 (60 jam, 6%)

Diketahui : Berat *crussible* Kosong (A) = 37,1408 gr

Berat Sampel (B) = 2,0 gr

Berat *crussible* + Abu (C) = 37,3515 gr

$$\begin{aligned} \% \text{ Kadar Abu} &= \frac{(A-C)}{B} \times 100\% \\ &= \frac{(37,3515-37,1408)}{2,0} \times 100\% \\ &= 10,53\% \end{aligned}$$

3. Perhitungan Rendemen Gelatin Tulang Ikan Patin

Rumus :

$$\% \text{ Rendemen} = \frac{A}{B} \times 100\%$$

Dimana :

A = Berat kering (bubuk gelatin) (gr)

B = Berat basah (tulang ikan) (gr)

Dengan menggunakan H₃PO₄ konsentrasi 4%

a. Sampel 1 (24 jam, 4%)

Diketahui : Berat Kering (A) = 7,9664 gr

Berat Basah (B) = 100 gr

$$\begin{aligned} \% \text{ Rendemen} &= \frac{A}{B} \times 100\% \\ &= \frac{7,9664 \text{ gr}}{100 \text{ gr}} \times 100\% \\ &= 7,9\% \end{aligned}$$

b. Sampel 2 (36 jam, 4%)

Diketahui : Berat Kering (A) = 7,7144 gr

Berat Basah (B) = 100 gr

$$\begin{aligned} \% \text{ Rendemen} &= \frac{A}{B} \times 100\% \\ &= \frac{7,7144 \text{ gr}}{100 \text{ gr}} \times 100\% \\ &= 7,7\% \end{aligned}$$

c. Sampel 3 (48 jam, 4%)

Diketahui : Berat Kering (A) = 6,8223 gr

Berat Basah (B) = 100 gr

$$\begin{aligned} \% \text{ Rendemen} &= \frac{A}{B} \times 100\% \\ &= \frac{6,8223 \text{ gr}}{100 \text{ gr}} \times 100\% \\ &= 6,8\% \end{aligned}$$

d. Sampel 4 (60 jam, 4%)

Diketahui : Berat Kering (A) = 7,1039 gr

Berat Basah (B) = 100 gr

$$\begin{aligned} \% \text{ Rendemen} &= \frac{A}{B} \times 100\% \\ &= \frac{7,1039 \text{ gr}}{100 \text{ gr}} \times 100\% \\ &= 7,1\% \end{aligned}$$

Dengan menggunakan H₃PO₄ konsentrasi 6%

e. Sampel 5 (24 jam, 6%)

Diketahui : Berat Kering (A) = 8,5527 gr

Berat Basah (B) = 100 gr

$$\begin{aligned} \% \text{ Rendemen} &= \frac{A}{B} \times 100\% \\ &= \frac{8,5527 \text{ gr}}{100 \text{ gr}} \times 100\% \\ &= 8,5\% \end{aligned}$$

f. Sampel 6 (36 jam, 6%)

Diketahui : Berat Kering (A) = 6,9333 gr

Berat Basah (B) = 100 gr

$$\begin{aligned} \% \text{ Rendemen} &= \frac{A}{B} \times 100\% \\ &= \frac{6,9333 \text{ gr}}{100 \text{ gr}} \times 100\% \\ &= 6,9\% \end{aligned}$$

g. Sampel 7 (48 jam, 6%)

Diketahui : Berat Kering (A) = 6,6925 gr

Berat Basah (B) = 100 gr

$$\begin{aligned} \% \text{ Rendemen} &= \frac{A}{B} \times 100\% \\ &= \frac{6,6925 \text{ gr}}{100 \text{ gr}} \times 100\% \\ &= 6,6\% \end{aligned}$$

h. Sampel 8 (60 jam, 6%)

Diketahui : Berat Kering (A) = 7,0676 gr

Berat Basah (B) = 100 gr

$$\begin{aligned} \% \text{ Rendemen} &= \frac{A}{B} \times 100\% \\ &= \frac{7,0676 \text{ gr}}{100 \text{ gr}} \times 100\% \\ &= 7,0\% \end{aligned}$$

4. Perhitungan Kekuatan Gel Gelatin Tulang Ikan Patin dengan Variasi Konsentrasi dan Waktu Perendaman

Rumus :

Konversi Nilai F :

$$\frac{1 \text{ kg}}{1000 \text{ gr}} \times \frac{9,81 \text{ N}}{1 \text{ kg}} \times \text{Peak Load} = \dots \text{ (N poise)}$$

Nilai D :

$$\text{Kekuatan Gel (D)} = \frac{F}{G} \times 980 \text{ N} = \dots \text{ (dyne/cm}^2\text{)}$$

Konversi ke bloom :

$$\text{(g bloom)} = 20 + 2,86 \times 10^{-3} \times \text{(D)}$$

Dimana :

D = Kekuatan Gel (dyne/cm²)

F = Gaya (Newton)

G = Konstanta (0,07)

Dengan menggunakan H₃PO₄ konsentrasi 4%**a. Sampel 1 (24 jam, 4%)**

Diketahui : Peak Load = 483,4

Final Load = 468,2

Faktor Konversi Nilai F

$$\frac{1 \text{ kg}}{1000 \text{ gr}} \times \frac{9,81 \text{ N}}{1 \text{ kg}} \times 483,4 = 4,7421 \text{ N poise}$$

$$\begin{aligned}
 \text{Kekuatan Gel (dyne/cm}^2\text{)} &= \frac{F}{G} \times 980 \text{ N} \\
 &= \frac{4,7421 \text{ N Poise}}{0,07} \times 980 \text{ N} \\
 &= 66.389,4 \text{ dyne/ cm}^2
 \end{aligned}$$

$$\begin{aligned}
 \text{Kekuatan Gel (gbloom)} &= 20 + 2,86 \times 10^{-3} \times D \\
 &= 20 + 2,86 \times 10^{-3} \times 66.389,4 \text{ dyne/ cm}^2 \\
 &= 209,8736 \text{ gbloom}
 \end{aligned}$$

b. Sampel 2 (36 jam, 4%)

Diketahui : Peak Load = 374,4

Final Load = 340,4

Faktor Konversi Nilai F

$$\frac{1 \text{ kg}}{1000 \text{ gr}} \times \frac{9,81 \text{ N}}{1 \text{ kg}} \times 374,4 = 3,6728 \text{ N poise}$$

$$\begin{aligned}
 \text{Kekuatan Gel (dyne/cm}^2\text{)} &= \frac{F}{G} \times 980 \text{ N} \\
 &= \frac{3,6728 \text{ N Poise}}{0,07} \times 980 \text{ N} \\
 &= 51.419,2 \text{ dyne/ cm}^2
 \end{aligned}$$

$$\begin{aligned}
 \text{Kekuatan Gel (gbloom)} &= 20 + 2,86 \times 10^{-3} \times D \\
 &= 20 + 2,86 \times 10^{-3} \times 51.419,2 \text{ dyne/ cm}^2 \\
 &= 167,0589 \text{ gbloom}
 \end{aligned}$$

c. Sampel 3 (48 jam, 4%)

Diketahui : Peak Load = 221,4

Final Load = 194,4

Faktor Konversi Nilai F

$$\frac{1 \text{ kg}}{1000 \text{ gr}} \times \frac{9,81 \text{ N}}{1 \text{ kg}} \times 221,4 = 2,1719 \text{ N poise}$$

$$\begin{aligned}
 \text{Kekuatan Gel (dyne/cm}^2\text{)} &= \frac{F}{G} \times 980 \text{ N} \\
 &= \frac{2,1719 \text{ N Poise}}{0,07} \times 980 \text{ N} \\
 &= 30.406,6 \text{ dyne/ cm}^2
 \end{aligned}$$

$$\begin{aligned}
 \text{Kekuatan Gel (gbloom)} &= 20 + 2,86 \times 10^{-3} \times D \\
 &= 20 + 2,86 \times 10^{-3} \times 30.406,6 \text{ dyne/ cm}^2 \\
 &= 106,9628 \text{ gbloom}
 \end{aligned}$$

d. Sampel 4 (60 jam, 4%)

$$\begin{aligned}
 \text{Diketahui : Peak Load} &= 127,4 \\
 \text{Final Load} &= 188,0
 \end{aligned}$$

Faktor Konversi Nilai F

$$\frac{1 \text{ kg}}{1000 \text{ gr}} \times \frac{9,81 \text{ N}}{1 \text{ kg}} \times 127,4 = 1,2497 \text{ N poise}$$

$$\begin{aligned}
 \text{Kekuatan Gel (dyne/cm}^2\text{)} &= \frac{F}{G} \times 980 \text{ N} \\
 &= \frac{1,2497 \text{ N Poise}}{0,07} \times 980 \text{ N} \\
 &= 17.495,8 \text{ dyne/ cm}^2
 \end{aligned}$$

$$\begin{aligned}
 \text{Kekuatan Gel (gbloom)} &= 20 + 2,86 \times 10^{-3} \times D \\
 &= 20 + 2,86 \times 10^{-3} \times 17.495,8 \text{ dyne/ cm}^2 \\
 &= 70,0379 \text{ gbloom}
 \end{aligned}$$

Dengan menggunakan H₃PO₄ konsentrasi 6%

e. Sampel 5 (24 jam, 6%)

$$\begin{aligned}
 \text{Diketahui : Peak Load} &= 236,0 \\
 \text{Final Load} &= 122,6
 \end{aligned}$$

Faktor Konversi Nilai F

$$\frac{1 \text{ kg}}{1000 \text{ gr}} \times \frac{9,81 \text{ N}}{1 \text{ kg}} \times 236,0 = 2,3151 \text{ N poise}$$

$$\begin{aligned}
 \text{Kekuatan Gel (dyne/cm}^2\text{)} &= \frac{F}{G} \times 980 \text{ N} \\
 &= \frac{2,3151 \text{ N Poise}}{0,07} \times 980 \text{ N} \\
 &= 32.411,4 \text{ dyne/ cm}^2
 \end{aligned}$$

$$\begin{aligned}
 \text{Kekuatan Gel (gbloom)} &= 20 + 2,86 \times 10^{-3} \times D \\
 &= 20 + 2,86 \times 10^{-3} \times 32.411,4 \text{ dyne/ cm}^2 \\
 &= 112,6966 \text{ gbloom}
 \end{aligned}$$

f. Sampel 6 (36 jam, 6%)

Diketahui : Peak Load = 233,2

Final Load = 161,2

Faktor Konversi Nilai F

$$\frac{1 \text{ kg}}{1000 \text{ gr}} \times \frac{9,81 \text{ N}}{1 \text{ kg}} \times 233,2 = 2,2876 \text{ N poise}$$

$$\begin{aligned} \text{Kekuatan Gel (dyne/cm}^2\text{)} &= \frac{F}{G} \times 980 \text{ N} \\ &= \frac{2,2876 \text{ N Poise}}{0,07} \times 980 \text{ N} \\ &= 32.026,4 \text{ dyne/ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Kekuatan Gel (gbloom)} &= 20 + 2,86 \times 10^{-3} \times D \\ &= 20 + 2,86 \times 10^{-3} \times 32.026,4 \text{ dyne/ cm}^2 \\ &= 111,5955 \text{ gbloom} \end{aligned}$$

g. Sampel 7 (48 jam, 6%)

Diketahui : Peak Load = 121,8

Final Load = 164,0

Faktor Konversi Nilai F

$$\frac{1 \text{ kg}}{1000 \text{ gr}} \times \frac{9,81 \text{ N}}{1 \text{ kg}} \times 121,8 = 1,1948 \text{ N poise}$$

$$\begin{aligned} \text{Kekuatan Gel (dyne/cm}^2\text{)} &= \frac{F}{G} \times 980 \text{ N} \\ &= \frac{1,1948 \text{ N Poise}}{0,07} \times 980 \text{ N} \\ &= 16.727,2 \text{ dyne/ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Kekuatan Gel (gbloom)} &= 20 + 2,86 \times 10^{-3} \times D \\ &= 20 + 2,86 \times 10^{-3} \times 16.727,2 \text{ dyne/ cm}^2 \\ &= 67,8397 \text{ gbloom} \end{aligned}$$

h. Sampel 8 (60 jam, 6%)

Diketahui : Peak Load = 139,0

Final Load = 193,2

Faktor Konversi Nilai F

$$\frac{1 \text{ kg}}{1000 \text{ gr}} \times \frac{9,81 \text{ N}}{1 \text{ kg}} \times 139,0 = 1,3635 \text{ N poise}$$

$$\begin{aligned} \text{Kekuatan Gel (dyne/cm}^2\text{)} &= \frac{F}{G} \times 980 \text{ N} \\ &= \frac{1,3635 \text{ N Poise}}{0,07} \times 980 \text{ N} \\ &= 19.089 \text{ dyne/ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Kekuatan Gel (gbloom)} &= 20 + 2,86 \times 10^{-3} \times D \\ &= 20 + 2,86 \times 10^{-3} \times 19.089 \text{ dyne/ cm}^2 \\ &= 74,5945 \text{ gbloom} \end{aligned}$$

5. Perhitungan Kadar Protein Gelatin Tulang Ikan Patin dengan Variasi Konsentrasi dan Waktu Perendaman

$\text{Konversi Kadar Protein (\%)} = \frac{\text{kadar Gelatin} \times 1000}{10.000}$
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Dengan menggunakan H_3PO_4 konsentrasi 4%

a. Sampel 1 (24 jam, 4%)

Diketahui : Kadar Protein (ppm) = 659.380 ppm

$$\begin{aligned} \text{Konversi Kadar Protein (\%)} &= \frac{\text{kadar Gelatin} \times 1000}{10.000} \\ &= \frac{659.380 \times 1000}{10.000} \\ &= 65,93\% \end{aligned}$$

b. Sampel 2 (36 jam, 4%)

Diketahui : Kadar Protein (ppm) = 554.300 ppm

$$\begin{aligned} \text{Konversi Kadar Protein (\%)} &= \frac{\text{kadar Gelatin} \times 1000}{10.000} \\ &= \frac{554.300 \times 1000}{10.000} \\ &= 55,43\% \end{aligned}$$

c. Sampel 3 (48 jam, 4%)

Diketahui : Kadar Protein (ppm) = 549.030 ppm

$$\begin{aligned} \text{Konversi Kadar Protein (\%)} &= \frac{\text{kadar Gelatin} \times 1000}{10.000} \\ &= \frac{549.030 \times 1000}{10.000} \\ &= 54,03\% \end{aligned}$$

d. Sampel 4 (60 jam, 4%)

Diketahui : Kadar Protein (ppm) = 548.140 ppm

$$\begin{aligned} \text{Konversi Kadar Protein (\%)} &= \frac{\text{kadar Gelatin} \times 1000}{10.000} \\ &= \frac{548.140 \times 1000}{10.000} \\ &= 54,81\% \end{aligned}$$

Dengan menggunakan H₃PO₄ konsentrasi 6%

e. Sampel 5 (24 jam, 6%)

Diketahui : Kadar Protein (ppm) = 773.080 ppm

$$\begin{aligned} \text{Konversi Kadar Protein (\%)} &= \frac{\text{kadar Gelatin} \times 1000}{10.000} \\ &= \frac{773.080 \times 1000}{10.000} \\ &= 77,30\% \end{aligned}$$

f. Sampel 6 (36 jam, 6%)

Diketahui : Kadar Protein (ppm) = 572.400 ppm

$$\begin{aligned} \text{Konversi Kadar Protein (\%)} &= \frac{\text{kadar Gelatin} \times 1000}{10.000} \\ &= \frac{572.400 \times 1000}{10.000} \\ &= 57,24\% \end{aligned}$$

g. Sampel 7 (48 jam, 6%)

Diketahui : Kadar Protein (ppm) = 551.760 ppm

$$\begin{aligned} \text{Konversi Kadar Protein (\%)} &= \frac{\text{kadar Gelatin} \times 1000}{10.000} \\ &= \frac{551.760 \times 1000}{10.000} \\ &= 55,17\% \end{aligned}$$

h. Sampel 8 (60 jam, 6%)

Diketahui : Kadar Protein (ppm) = 587.220 ppm

$$\begin{aligned} \text{Konversi Kadar Protein (\%)} &= \frac{\text{kadar Gelatin} \times 1000}{10.000} \\ &= \frac{587.220 \times 1000}{10.000} \\ &= 58,72\% \end{aligned}$$

LAMPIRAN C DOKUMENTASI PROSEDUR PENELITIAN

I. Proses Pembuatan Gelatin

Tahap Degradasing



Gambar 1. Tulang Ikan Patin (Bahan Utama)



Gambar 4. Proses Pengecilan Tulang



Gambar 2. Proses Perebusan Tulang



Gambar 5. Tulang yang telah Dikecilkan



Gambar 3. Tulang yang telah Direbus

Tahap Demineralisasi



Gambar 6. Pembuatan Larutan H_3PO_4



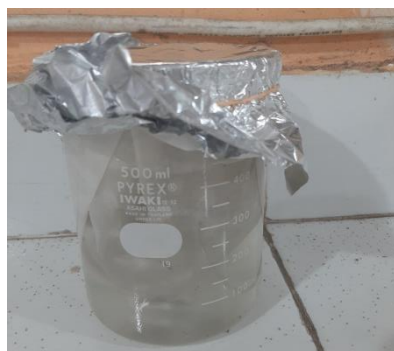
Gambar 7. Larutan H_3PO_4 4% dan 6%



Gambar 8. Bahan baku yang siap direndam



Gambar 9. Memasukkan bahan



Gambar 10. Sebelum dan sesudah perendaman dengan larutan H_3PO_4



Gambar 11. Proses pembilasan tulang

Tahap Ekstraksi



Gambar 12 Proses ekstraksi



Gambar 13. Penyaringan hasil ekstraksi

Tahap Pengovenan



Gambar 14. Proses pemekatan sampel



Gambar 15. Proses pengeringan sampel

Tahap Akhir Pembuatan Gelatin



Gambar 16. Gelatin kering



Gambar 17. Gelatin kering sudah dihaluskan

II. Tahap Analisis

Tahap Analisis Nilai pH



Gambar 18. Menganalisis pH dari Gelatin Tulang ikan Patin Dengan Larutan H_3PO_4 4% dan 6% didapat nilai masing-masing 4 - 5

Tahap Analisis Kasar Air



Gambar 19. Menimbang Sampel sebanyak 1 gram



Gambar 20. Sampel dimasukkan kedalam oven



Gambar 21. Proses Pengovenan (Uji Kadar Air) pada suhu 105°C Selama 1 Jam

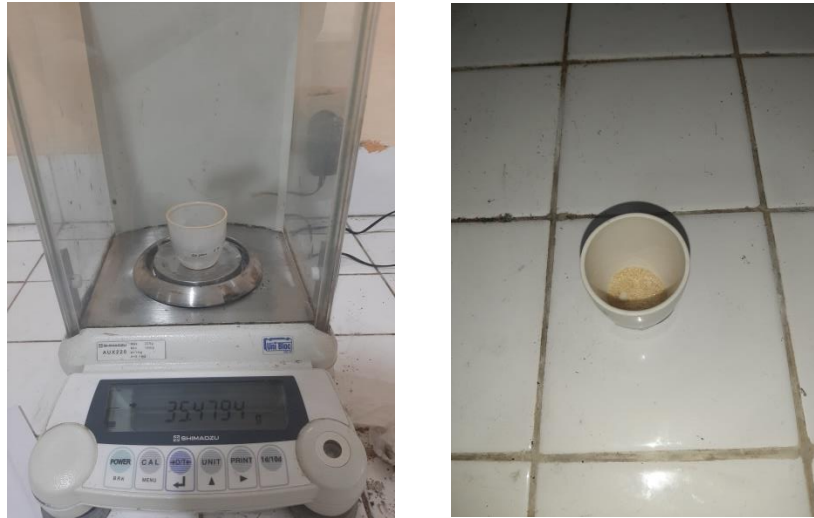


Gambar 22. Setelah 1 Jam Sampel diambil



Gambar 23. Hasil dari Uji kadar air

Tahap Analisis Kadar Abu



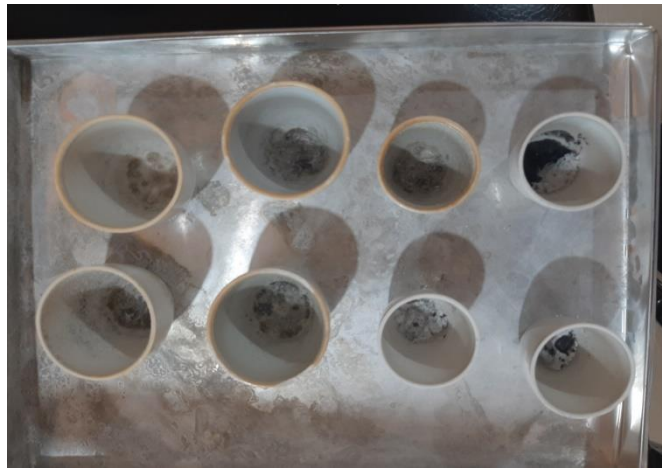
Gambar 24. Analisis Kadar Abu Dimulai Dengan Menimbang Masing-Masing Sampel 2 gram



Gambar 25. Kemudian Dimasukan Kedalam Furnace Dengan Suhu 600°C Selama 4 Jam



Gambar 26. Menimbang Hasil Kadar Abu yang Didapat



Gambar 27. Hasil Analisis Kadar Abu

Tahap Analisis Kekuatan Gel



Gambar 28. Analisis sampel untuk diuji Kekuatan Gel



Gambar 29. Alat Uji Kekuatan Gel (*Texture Analyzer*)