**LAMPIRAN**

**Lampiran 1. Tabel Formulasi Untuk Setiap Perlakuan**

Tabel 24. Formulasi Makaroni Tepung Komposit Penelitian Pendahuluan Basis 200 gram

|  |  |  |
| --- | --- | --- |
| **Bahan Yang Diguakan** | **Jumlah (%)** | **Jumlah (g)** |
| Tepung Komposit (6:2:2)  - Tepung Terigu  - Tepung Kacang Koro  - Tepung Singkong | 37,8  12,6  12,6 | 75,6  25,2  25,2 |
| Air | 30 | 60 |
| Margarin | 5 | 10 |
| Garam | 1 | 2 |
| CMC | 1 | 2 |

Tabel 25. Formulasi Makaroni Tepung Komposit Penelitian Utama perbandingan tepung komposit (10 : 0 : 0) Basis 200 gram

|  |  |  |
| --- | --- | --- |
| **Bahan Yang Diguakan** | **Jumlah (%)** | **Jumlah (g)** |
| Tepung Komposit (10:0:0)  - Tepung Terigu  - Tepung Kacang Koro  - Tepung Singkong | 63  0  0 | 126  0  0 |
| Air | 30 | 60 |
| Margarin | 5 | 10 |
| Garam | 1 | 2 |
| CMC | 1 | 2 |

Tabel 26. Formulasi Makaroni Tepung Komposit Penelitian Utama perbandingan tepung komposit (8 : 1 : 1) Basis 200 gram

|  |  |  |
| --- | --- | --- |
| **Bahan Yang Diguakan** | **Jumlah (%)** | **Jumlah (g)** |
| Tepung Komposit (8:1:1)  - Tepung Terigu  - Tepung Kacang Koro  - Tepung Singkong | 48  6  6 | 144  18  18 |
| Air | 30 | 60 |
| Margarin | 5 | 10 |
| Garam | 1 | 2 |
| CMC | 1 | 2 |

Tabel 27. Formulasi Makaroni Tepung Komposit Penelitian Utama perbandinga tepung komposit (6 : 2 : 2) Basis 200 gram

|  |  |  |
| --- | --- | --- |
| **Bahan Yang Diguakan** | **Jumlah (%)** | **Jumlah (g)** |
| Tepung Komposit (6:2:2)  - Tepung Terigu  - Tepung Kacang Koro  - Tepung Singkong | 37,8  12,6  12,6 | 75,6  25,2  25,2 |
| Air | 30 | 60 |
| Margarin | 5 | 10 |
| Garam | 1 | 2 |
| CMC | 1 | 2 |

Tabel 28. Formulasi Makaroni Tepung Komposit Penelitian Utama perbandingan tepung komposit (4 : 3 : 3) Basis 200 gram

|  |  |  |
| --- | --- | --- |
| **Bahan Yang Diguakan** | **Jumlah (%)** | **Jumlah (g)** |
| Tepung Komposit (4 : 3 : 3)  - Tepung Terigu  - Tepung Kacang Koro  - Tepung Singkong | 25,2  18,9  18,9 | 50,4  37,8  37,8 |
| Air | 30 | 60 |
| Margarin | 5 | 10 |
| Garam | 1 | 2 |
| CMC | 1 | 2 |

Tabel 29. Formulasi Makaroni Tepung Komposit Penelitian Utama perbandingan tepung komposit (2 : 4 : 4) Basis 200 gram

|  |  |  |
| --- | --- | --- |
| **Bahan Yang Diguakan** | **Jumlah (%)** | **Jumlah (g)** |
| Tepung Komposit (2 : 4 : 4)  - Tepung Terigu  - Tepung Kacang Koro  - Tepung Singkong | 25,2  12,6  12,6 | 50,4  25,2  25,2 |
| Air | 30 | 60 |
| Margarin | 5 | 10 |
| Garam | 1 | 2 |
| CMC | 1 | 2 |

**Lampiran 2. Prosdur Uji Organoleptik (Setyaningsih et al. 2010)**

Pengujian organoleptik pada penelitian ini menggunakan uji hedonik atau uji kesukaan yang merupakan salah satu uji penerimaan. Dalam uji ini panelis diminta mengungkapkan tanggapan pribadinya tentang kesukaan atau sebaliknya (ketidaksukaan), didamping itu mereka juga mengemukakan tingkat kesukaan/ ketidaksukaan. Tingat- tingkat kesukaan ini disebut sebagai skala hedonik, seperti sangat suka, suka, agak suka, agak tidak suka, tidak suka dan sangat tidak suka. Dalam analisis skala hedonik ditrasformasikan menjadi skala numerik dengan angka menaik menurut tingkat kesukaan. Dengan adanya skala hedonik ini secara tidak langsung uji hedonik dapat digunakan untuk mengetahui adanya perbedaan.

Uji rating hedonik dilakukan kepada 30 orang panelis terhadap produk makaroni matang dengan latar belakang mahasiswa TP Unpas. Parameter yang diuji pada uji rating hedonik ini yaitu warna, bentuk, kekenyalan, aroma dan rasa. Tingkat kesukaan pada uji rating hedonik dinyatakan dengan 6 skala numerik yang menunjukkan tingkat kesukaan panelis terhadap produk dari skala 1 untuk sangat tidak suka dan skala 6 untuk sangat suka. Pengolahan data dilakukan dengan menggunakan analisa sidik ragam, data yang didapat kemudian dibandingkan antara contoh yang iujikan dan hasil pengukuran tekstur obyektif, serta dilihat contoh mana yang paling disukai oleh panelis secara keseluruhan.

**Lampiran 3. Formulir Uji Organoleptik Penelitian Pendahuluan**

FORMULIR UJI ORGANOLEPTIK

**UJI HEDONIK**

Sampel : **Makaroni Matang**

Nama Panelis :

Tanggal :

Paraf :

1. Dihadapan saudara disajikan sampel Makaroni mentah. Anda diminta untuk memberikan penilaian dengan keterangan untuk masing – masing tabel. Penilaian bersifat hedonik (kesukaan berdasarkan skala hedonik).
2. Terlebih dahulu anda dipersilahkan memperhatikan produk dihadapan anda dengan seksama.

Tabel Penilaian :

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Kode Sampel** | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |
| **Warna** |  |  |  |  |  |  |  |  |  |  |
| **Aroma** |  |  |  |  |  |  |  |  |  |  |
| **Kekenyalan** |  |  |  |  |  |  |  |  |  |  |
| **Rasa** |  |  |  |  |  |  |  |  |  |  |

Keterangan:

|  |  |
| --- | --- |
| **Skala Numerik** | **Nilai Numerik** |
| Tidak Suka  Agak Tidak Suka  Agak Suka  Suka  Sangat Suka | 1  2  3  4  5 |

**Lampiran 4. Formulir Uji Organoleptik Penelitian Utama**

FORMULIR UJI ORGANOLEPTIK

**UJI HEDONIK**

Sampel : **Makaroni Matang**

Nama Panelis :

Tanggal :

Paraf :

1. Dihadapan saudara disajikan sampel Makaroni mentah. Anda diminta untuk memberikan penilaian dengan keterangan untuk masing – masing tabel. Penilaian bersifat hedonik (kesukaan berdasarkan skala hedonik).
2. Terlebih dahulu anda dipersilahkan memperhatikan produk dihadapan anda dengan seksama.

Tabel Penilaian :

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Kode Sampel** | **Parameter** | | | | |
| **Warna** | **Bentuk** | **Kekenyalan** | **Aroma** | **Rasa** |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

Keterangan:

|  |  |
| --- | --- |
| **Skala Numerik** | **Nilai Numerik** |
| Tidak Suka  Agak Tidak Suka  Agak Suka  Suka  Sangat Suka | 1  2  3  4  5 |

**Lampiran 5. Prosedur Analisis Kadar Air (AOAC 1995)**

Cawan aluminium kosong dan tutupnya dikeringkan dalam oven selama 15 menit, didinginkan dalam desikator selama 10 menit kemudian ditimbang (a gram). Sampel yang beratnya ± 5 gram dimasukkan ke dalam cawan yang telah diketahui beratnya. Cawan beserta isi dan tutupnya dimasukkan ke dalam oven bersuhu 105ºC sampai beratnya konstan. Selanjutnya cawan beserta isinya didinginkan dalam desikator selama 10 menit dan ditimbang (b gram). Perhitungan kadar air dapat dilakukan berdasarkan basis basah dengan rumus :

# Kadar air (%bb) =

Keterangan : % bb = kadar air / bahan basah

a = berat cawan (g)

b = berat cawan dan sampel akhir (g)

c = berat sampel awal (g)

**Lampiran 6. Prosedur Analisis Karbohidrat**

Metode penentuan kadar karbohidrat pati adalah pertama- tama sampel sebanyak 1 gram ditimbang, ditambahkan 15 ml HCl pekat dan dihimpitkan hingga 200 ml.dipanaskan selama 2,5 jam dan tetap dijaga volume total tetap 200 ml, kemudian didinginkan dan ditambahkan indikator PP da NaOh 30% sampai warna merah muda, jika kelebihan NaOH ditambahkan HcL 9,5 N sampai netral. Didinginkan kembali dan dimasukkan kedalam labu takar 500 ml ditambahkan aquades hingga tanda batas (larutan C).

Dipipet 10 ml sampel dari larutan C ditambahkan 50 ml aquades dipanaskan kembali 10 menit kemudian dinginkan. Ditambahkan 10 ml H2SO4 6N dan KI 1,5 gram keudian dititrasi dengan Na2S2O3 0,1 N Sampai titik akhir titrasi lerutan berubah dari kuning jerami ditambahkan 1 ml amilum dititrasi kembali sampai TAT warna biru hilang.

Perhitungan :

**Lampiran 7. Prosedur Analisis Kadar Protein**

1. Dasar Analisis

Senyawa mitrogen diubah menjadi amonium sulfat oleh H2SO4 pekat. Amonium sulfat yang terbentuk diuraikan NaOH. Amoniak yang dibebaskan diikat dengan asam borat dan kemudian dititar dengan larutan baku asam.

2. Peralatan

a. Labu Kjedal 100 ml

b. Alat penyulingan dan kelengkapannya

c. Pemanas listrik/ pembakar

3. Pereaksi

a. Campuran selen

Campuran 2,5 gram serbuk SeO2, 100 gr K2SO4 dan 20 gram CuSO4.5H2O

b. Indikator Campuran

Siapkan larutan bromocressol green 0,1% dan larutan 0,1% dalam alkohol 95% secara terpisah. Campur 10 ml bromocressol green dengan 2 ml merah metil.

c. Larutan asam borat H3BO3 2%

Larutkan 10 gram H3BO3 dalam 500 ml air suling. Setelah dingin pindahkan kedalam botol bertutup gelas. Campur 500 ml asam borat dengan 5 ml indikator campuran.

d. Larutan asam klorida HCl 0,1 N

Ukur dengan gelas ukur 8,9 ml hcl pekat dan encerkan dalam labu ukur 1 liter dengan aquadest

e. Larutan Natrium Hidroksida (NaOH) 30%

Larutkan 1150 gram natrium hidroksida kedalam 50 ml air, simpan dalam botol bertutup karet.

5. Prosedur Kerja

a. Ditimbang dengan seksama 0,51 gram sampel, masukkan ke dalam labu Kjedahll 100 ml, ditambahkan 2 gram campuran selen dan 25 ml H2SO4 pekat

b. Dipanaskan diatas pemanas listrik atau api pembakar sampai mendidih dan larutan menjadi jernih kehijau- hijauan ( sekitar 2 jam), biarkan dingin, kemudian encerkan dan masukkan ke dalam labu ukur 100 ml, tetapkan sampai tanda batas.

c. Dipipet 5 ml larutan dimasukkan ke dalam alat penyuling, tambahkan 5 ml NaOH 30 % dan beberapa tetes indikator PP. Sulingkann selama ± 10 menit, sebagian penampung gunakan 10 ml larutan asam borat 2% yang telah dicampur indikator. Bilas ujung pendingin dengan air suling, dititar dengan larutan HCL 0,01 N.

6. Perhitungan :

Kadar Protein = x 100%

Dimana : W = Bobot sampel

V1 = Volume HCl penitar sampel

V2 = Volume HCl blangko

N = Normalitas HCl

Fk = Faktor konversi protein

Fp = Faktor pengenceran

**Lampiran 7. Prosdur Analisis Karakteristik Fisik**

**1. Analisis Tekstur dengan Penetrometeer**

Parameter tekstur yang diukur pada produk makaroni adalah kekerasan. Pengukuran dilakukan dengan menggunakan penetrometer. Adapun prosedur analisis dengan menggunakan penetrometer adalah:

1. Bahan yang diukur kekerasannya diletakkan tepat dibawah jarum penusuk penetrometer.
2. Penusukan dilakukan pada bahan sebaanyak 10 kali pada seluruh tempat, hasil setiap penusukan ditunjukkan dengan angka pada skala penetrometer.
3. Waktu yang diperlukan untuk penekanan maksimum terhadap bahan dapat ditetapkan dengan mengunakan stop watch selama 10 detik.
4. Hasil perhitungan adalah angka rata- rata yang diperoleh dari pengukuran, dan satuan yang digunakan adalah milimeter (mm) per 10 detik dengan bobot beban tertentu yang dinyatakan dalam gram atau mm/detik/gram.

**Lampiran 8. Perhitungan Banyaknya Ulangan**

Untuk menentukan banyaknya ulangan digunakan rumus sebagai berikut :

1. Penelian Pendahuluan

Diketahui : t = 1 x 3 = 3 perlakuan

Ditanyakan : r ?

Maka : (t – 1) x (r – 1) ≥ 15

(3–1) x (r – 1) ≥ 15

(3r – r) + (1 – 3) ≥ 15

2r ≥ 15 – 1 + 3

2r ≥ 17

r ≥ = 8,5 9

r = 9 kali ulangan

1. Penelian Utama

(t – 1) x (r – 1) ≥ 15

Diketahui : t = 3 x 5 = 15 perlakuan

Ditanyakan : r ?

Maka : (t – 1) x (r – 1) ≥ 15

(15–1) x (r – 1) ≥ 15

(15r – r) + (1 – 15) ≥ 15

14r ≥ 15 – 1 + 15

14r ≥ 29

r ≥ = 2,07 2

r = 2 kali ulangan

**Lampiran 9 : Data Uji Organoleptik Penelitian Pendahuluan**

Tabel Hasil Uji Organoleptik Makaroni Cassava Koro Terhadap Parameter Warna

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Panelis | Ulangan I | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 512 | | 134 | | 383 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 2 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 3 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 4 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 5 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 6 | 2 | 1,58 | 4 | 2,12 | 5 | 2,35 | 11 | 6,05 | 3,67 | 2,02 |
| 7 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 8 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 9 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 10 | 2 | 1,58 | 4 | 2,12 | 4 | 2,12 | 10 | 5,82 | 3,33 | 1,94 |
| 11 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 12 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 13 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 14 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 15 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 16 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 17 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 18 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 19 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 20 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 21 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 22 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 23 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 24 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 25 | 3 | 1,87 | 3 | 1,87 | 5 | 2,35 | 11 | 6,09 | 3,67 | 2,03 |
| 26 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 27 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 28 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 29 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 30 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| Total | 98,00 | 58,01 | 109,00 | 60,88 | 123,00 | 64,15 | 330,00 | 183,05 | 110,00 | 61,02 |
| Rata-rata | 3,27 | 1,93 | 3,63 | 2,03 | 4,10 | 2,14 | 11,00 | 6,10 | 3,67 | 2,03 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Panelis | Ulangan II | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 611 | | 503 | | 932 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 2 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 3 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 4 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 5 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 6 | 2 | 1,58 | 4 | 2,12 | 5 | 2,35 | 11 | 6,05 | 3,67 | 2,02 |
| 7 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 8 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 9 | 3 | 1,87 | 3 | 1,87 | 5 | 2,35 | 11 | 6,09 | 3,67 | 2,03 |
| 10 | 2 | 1,58 | 4 | 2,12 | 4 | 2,12 | 10 | 5,82 | 3,33 | 1,94 |
| 11 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 12 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 13 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 14 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 15 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 16 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 17 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 18 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 19 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 20 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 21 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 22 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 23 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 24 | 4 | 2,12 | 2 | 1,58 | 3 | 1,87 | 9 | 5,57 | 3,00 | 1,86 |
| 25 | 2 | 1,58 | 2 | 1,58 | 5 | 2,35 | 9 | 5,51 | 3,00 | 1,84 |
| 26 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 27 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 28 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 29 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 30 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| Total | 96 | 57,47 | 107,00 | 60,30 | 121,00 | 63,62 | 324,00 | 181,40 | 108,00 | 60,47 |
| Rata-rata | 3,20 | 1,92 | 3,57 | 2,01 | 4,03 | 2,12 | 10,80 | 6,05 | 3,60 | 2,02 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Panelis | Ulangan III | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 104 | | 311 | | 235 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 2 | 2 | 1,58 | 4 | 2,12 | 4 | 2,12 | 10 | 5,82 | 3,33 | 1,94 |
| 3 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 4 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 5 | 3 | 1,87 | 3 | 1,87 | 2 | 1,58 | 8 | 5,32 | 2,67 | 1,77 |
| 6 | 2 | 1,58 | 4 | 2,12 | 5 | 2,35 | 11 | 6,05 | 3,67 | 2,02 |
| 7 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 8 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 9 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 10 | 2 | 1,58 | 4 | 2,12 | 4 | 2,12 | 10 | 5,82 | 3,33 | 1,94 |
| 11 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 12 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 13 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 14 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 15 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 16 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 17 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 18 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 19 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 20 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 21 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 22 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 23 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 24 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 25 | 2 | 1,58 | 2 | 1,58 | 5 | 2,35 | 9 | 5,51 | 3,00 | 1,84 |
| 26 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 27 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 28 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 29 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 30 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| Total | 90 | 55,81 | 109,00 | 60,85 | 124,00 | 64,31 | 323,00 | 180,97 | 107,67 | 60,32 |
| Rata-rata | 3,00 | 1,86 | 3,63 | 2,03 | 4,13 | 2,14 | 10,77 | 6,03 | 3,59 | 2,01 |

|  |  |  |  |  |  |  |  |  |  |  |
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| Panelis | Ulangan IV | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 454 | | 421 | | 326 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 2 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 3 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 4 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 5 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 6 | 2 | 1,58 | 4 | 2,12 | 5 | 2,35 | 11 | 6,05 | 3,67 | 2,02 |
| 7 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 8 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 9 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 10 | 2 | 1,58 | 4 | 2,12 | 4 | 2,12 | 10 | 5,82 | 3,33 | 1,94 |
| 11 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 12 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 13 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 14 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 15 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 16 | 5 | 2,35 | 3 | 1,87 | 3 | 1,87 | 11 | 6,09 | 3,67 | 2,03 |
| 17 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 18 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 19 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 20 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 21 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 22 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 23 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 24 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 25 | 2 | 1,58 | 2 | 1,58 | 5 | 2,35 | 9 | 5,51 | 3,00 | 1,84 |
| 26 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 27 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 28 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 29 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 30 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| Total | 99 | 58,20 | 109,00 | 60,85 | 122,00 | 63,87 | 330,00 | 182,92 | 110,00 | 60,97 |
| Rata-rata | 3,30 | 1,94 | 3,63 | 2,03 | 4,07 | 2,13 | 11,00 | 6,10 | 3,67 | 2,03 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Panelis | Ulangan V | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 602 | | 222 | | 453 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 4 | 2,12 | 3 | 1,87 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 2 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 3 | 2 | 1,58 | 3 | 1,87 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 4 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 5 | 2 | 1,58 | 3 | 1,87 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 6 | 2 | 1,58 | 4 | 2,12 | 5 | 2,35 | 11 | 6,05 | 3,67 | 2,02 |
| 7 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 8 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 9 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 10 | 2 | 1,58 | 4 | 2,12 | 4 | 2,12 | 10 | 5,82 | 3,33 | 1,94 |
| 11 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 12 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 13 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 14 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 15 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 16 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 17 | 3 | 1,87 | 2 | 1,58 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 18 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 19 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 20 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 21 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 22 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 23 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 24 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 25 | 2 | 1,58 | 2 | 1,58 | 5 | 2,35 | 9 | 5,51 | 3,00 | 1,84 |
| 26 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 27 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 28 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 29 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 30 | 3 | 1,87 | 2 | 1,58 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| Total | 98 | 57,89 | 103,00 | 59,26 | 119,00 | 63,08 | 320,00 | 180,24 | 106,67 | 60,08 |
| Rata-rata | 3,27 | 1,93 | 3,43 | 1,98 | 3,97 | 2,10 | 10,67 | 6,01 | 3,56 | 2,00 |

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| Panelis | Ulangan VI | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 831 | | 145 | | 208 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 2 | 5 | 2,35 | 4 | 2,12 | 4 | 2,12 | 13 | 6,59 | 4,33 | 2,20 |
| 3 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| 4 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 5 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 6 | 2 | 1,58 | 4 | 2,12 | 5 | 2,35 | 11 | 6,05 | 3,67 | 2,02 |
| 7 | 2 | 1,58 | 3 | 1,87 | 5 | 2,35 | 10 | 5,80 | 3,33 | 1,93 |
| 8 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 9 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 10 | 2 | 1,58 | 4 | 2,12 | 4 | 2,12 | 10 | 5,82 | 3,33 | 1,94 |
| 11 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 12 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 13 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 14 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 15 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 16 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 17 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 18 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 19 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 20 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 21 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 22 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 23 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 24 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 25 | 2 | 1,58 | 1 | 1,22 | 5 | 2,35 | 8 | 5,15 | 2,67 | 1,72 |
| 26 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 27 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 28 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 29 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 30 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| Total | 96 | 57,33 | 107,00 | 60,20 | 125,00 | 64,60 | 328,00 | 182,13 | 109,33 | 60,71 |
| Rata-rata | 3,20 | 1,91 | 3,57 | 2,01 | 4,17 | 2,15 | 10,93 | 6,07 | 3,64 | 2,02 |

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| Panelis | Ulangan VII | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 399 | | 253 | | 312 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 2 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 3 | 4 | 2,12 | 2 | 1,58 | 3 | 1,87 | 9 | 5,57 | 3,00 | 1,86 |
| 4 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 5 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 6 | 2 | 1,58 | 4 | 2,12 | 5 | 2,35 | 11 | 6,05 | 3,67 | 2,02 |
| 7 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 8 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 9 | 4 | 2,12 | 3 | 1,87 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 10 | 2 | 1,58 | 4 | 2,12 | 4 | 2,12 | 10 | 5,82 | 3,33 | 1,94 |
| 11 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 12 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 13 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 14 | 4 | 2,12 | 3 | 1,87 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 15 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 16 | 4 | 2,12 | 3 | 1,87 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 17 | 3 | 1,87 | 3 | 1,87 | 2 | 1,58 | 8 | 5,32 | 2,67 | 1,77 |
| 18 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 19 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 20 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 21 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 22 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 23 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 24 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 25 | 2 | 1,58 | 2 | 1,58 | 5 | 2,35 | 9 | 5,51 | 3,00 | 1,84 |
| 26 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 27 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 28 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 29 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 30 | 3 | 1,87 | 3 | 1,87 | 2 | 1,58 | 8 | 5,32 | 2,67 | 1,77 |
| Total | 102 | 58,97 | 105,00 | 59,80 | 125,00 | 64,49 | 332,00 | 183,27 | 110,67 | 61,09 |
| Rata-rata | 3,40 | 1,97 | 3,50 | 1,99 | 4,17 | 2,15 | 11,07 | 6,11 | 3,69 | 2,04 |

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| Panelis | Ulangan VIII | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 276 | | 412 | | 212 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 2 | 3 | 1,87 | 2 | 1,58 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 3 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 4 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 5 | 2 | 1,58 | 3 | 1,87 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 6 | 2 | 1,58 | 4 | 2,12 | 5 | 2,35 | 11 | 6,05 | 3,67 | 2,02 |
| 7 | 2 | 1,58 | 4 | 2,12 | 5 | 2,35 | 11 | 6,05 | 3,67 | 2,02 |
| 8 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 9 | 4 | 2,12 | 3 | 1,87 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 10 | 2 | 1,58 | 4 | 2,12 | 4 | 2,12 | 10 | 5,82 | 3,33 | 1,94 |
| 11 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 12 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 13 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 14 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 15 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 16 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 17 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 18 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 19 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 20 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 21 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 22 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 23 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 24 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 25 | 2 | 1,58 | 2 | 1,58 | 4 | 2,12 | 8 | 5,28 | 2,67 | 1,76 |
| 26 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 27 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 28 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 29 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 30 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| Total | 98 | 57,89 | 105,00 | 59,80 | 124,00 | 64,38 | 327,00 | 182,07 | 109,00 | 60,69 |
| Rata-rata | 3,27 | 1,93 | 3,50 | 1,99 | 4,13 | 2,15 | 10,90 | 6,07 | 3,63 | 2,02 |

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| Panelis | Ulangan IX | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 109 | | 216 | | 355 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 2 | 2 | 1,58 | 1 | 1,22 | 4 | 2,12 | 7 | 4,93 | 2,33 | 1,64 |
| 3 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 4 | 2 | 1,58 | 4 | 2,12 | 4 | 2,12 | 10 | 5,82 | 3,33 | 1,94 |
| 5 | 2 | 1,58 | 1 | 1,22 | 2 | 1,58 | 5 | 4,39 | 1,67 | 1,46 |
| 6 | 2 | 1,58 | 4 | 2,12 | 5 | 2,35 | 11 | 6,05 | 3,67 | 2,02 |
| 7 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 8 | 4 | 2,12 | 2 | 1,58 | 4 | 2,12 | 10 | 5,82 | 3,33 | 1,94 |
| 9 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 10 | 2 | 1,58 | 4 | 2,12 | 4 | 2,12 | 10 | 5,82 | 3,33 | 1,94 |
| 11 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 12 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 13 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 14 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 15 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 16 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 17 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 18 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 19 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 20 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 21 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 22 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 23 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 24 | 3 | 1,87 | 2 | 1,58 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 25 | 2 | 1,58 | 3 | 1,87 | 5 | 2,35 | 10 | 5,80 | 3,33 | 1,93 |
| 26 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 27 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 28 | 3 |  | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 29 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 30 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| Total | 92 | 56,35 | 100,00 | 58,26 | 123,00 | 64,09 | 315,00 | 178,70 | 105,00 | 59,57 |
| Rata-rata | 3,07 | 1,88 | 3,33 | 1,94 | 4,10 | 2,14 | 10,50 | 5,96 | 3,50 | 1,99 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data Asli Uji Organoleptik Terhadap Warna Makaroni Cassava Koro | | | | |
| Kelompok Ulangan | Suhu Pengukusan Makaroni | | | Total Kelompok |
| a1 | a2 | a3 |
| 1 | 3,27 | 3,27 | 4,10 | 10,63 |
| 2 | 3,20 | 3,57 | 4,03 | 10,80 |
| 3 | 3,00 | 3,63 | 4,13 | 10,77 |
| 4 | 3,30 | 3,63 | 4,07 | 11,00 |
| 5 | 3,27 | 3,43 | 3,97 | 10,67 |
| 6 | 3,20 | 3,57 | 4,17 | 10,93 |
| 7 | 3,40 | 3,50 | 4,17 | 11,07 |
| 8 | 3,27 | 3,50 | 4,13 | 10,90 |
| 9 | 3,07 | 3,33 | 4,10 | 10,50 |
| Total perlakuan | 28,97 | 31,43 | 36,87 | 97,27 |
| Rata-rata | 3,22 | 3,49 | 4,10 | 10,81 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data Transformasi Makaroni Cassava Koro Terhadap Warna | | | | |
| Kelompok Ulangan | Suhu Pengukusan Makaroni | | | Total Kelompok |
| a1 | a2 | a3 |
| 1 | 1,93 | 2,03 | 2,14 | 6,10 |
| 2 | 1,92 | 2,01 | 2,12 | 6,05 |
| 3 | 1,86 | 2,03 | 2,14 | 6,03 |
| 4 | 1,94 | 2,03 | 2,13 | 6,10 |
| 5 | 1,93 | 1,98 | 2,10 | 6,01 |
| 6 | 1,91 | 2,01 | 2,15 | 6,07 |
| 7 | 1,97 | 1,99 | 2,15 | 6,11 |
| 8 | 1,93 | 1,99 | 2,15 | 6,07 |
| 9 | 1,88 | 1,94 | 2,14 | 5,96 |
| Total perlakuan | 17,26 | 18,01 | 19,22 | 54,49 |
| Rata-rata | 1,92 | 2,00 | 2,14 | 10,90 |

Perhitungan ANAVA

Faktor Koreksi (FK) =

=

= 109, 97

JK Total (JKT) = - FK

= – 109,97

= 0,2335

JK Kelompok (JKK) = - FK

= – 109,97

= 0,0066

JK Perlakuan (JKP) = - FK

= – 109,97

= 0,2166

JK Galat (JKG) = JKT – JKK- JKP

= 0,2335 – 0,0066 – 0,2166

= 0,0103

Tabel ANAVA Uji Organoleptik Terhadap Warna

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sumber Keterangan | Db | JK | KT | F Hitung | F Tabel |
| Kelompok | 8 | 0,0066 | 0,0008 | - | - |
| Perlakuan | 2 | 0,2166 | 0,1083 | 168,056 \* | 3,63 |
| Galat | 16 | 0,0103 | 0,0006 |  |  |
| Total | 26 | 0,2335 |  |  |  |

\*) Berpengaruh Nyata

Kesimpulan :

Berdasarkan Tabel ANAVA diatas, F Hitung lebih besar dibandingkan F tabel pada taraf 5 % maka dapat disimpulkan bahwa perlakuan suhu pengukusan makaroni berpengaruh terhadap warna makaroni sehingga perlu dilakukan uji lanjut, uji lanjut yang digunakan adalah uji lanjut Duncan.

**Perhitungan Uji Lanjut Duncan**

Sy = = = 0,085

Uji Lanjut Duncan Terhadap Warna Makaroni

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Kode Sampel | Rata-rata Perlakuan | Perlakuan | | | | | Taraf Nyata |
| 1 | | 2 | | 3 |
| - | - | a1 | 1,92 | - |  | - |  | - | a |
| 3,00 | 0,0254 | a2 | 2,00 | 0,08 | \* | - |  | - | b |
| 3,15 | 0,0267 | a3 | 2,14 | 0,22 | \* | 0,13 | tn | - | b |

Keterangan : \*) Berbeda nyata tn) tidak berbeda nyata

Data Hasil Uji Lanjut Duncan Terhadap Warna Makaroni Cassava Koro

|  |  |  |
| --- | --- | --- |
| Perlakuan Suhu Pengukusan Makaroni | Nilai Asli Rata- Rata Warna | Taraf Nyata 5% |
| a1 (60oC) | 3,22 | a |
| a2 (80oC) | 3,49 | b |
| a3 (100oC) | 4,10 | b |

Kesimpulan :

Berdasarkan tabel hasil uji lanjut Duncan dapat disimpulkan bahwa terjadi peningkatan warna yang nyata pada perlakuan a1 terhadap a2 dan a3, tetapi tidak terjadi pada perlakuan a2 terhadap a3.

Tabel Hasil Uji Organoleptik Makaroni Cassava Koro Terhadap Parameter Rasa

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Panelis | Ulangan I | | | | | | | | | |
| Suhu Pengukusan Makaroni Cassava Koro | | | | | | | | | |
| 512 | | 134 | | 383 | | Jumlah | | Rata-rata | |
| 60oC | | 80oC | | 100oC | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 4 | 2,12 | 4 | 1,87 | 4 | 2,12 | 12 | 6,11 | 4,00 | 2,04 |
| 2 | 4 | 2,12 | 4 | 1,87 | 4 | 2,12 | 12 | 6,11 | 4,00 | 2,04 |
| 3 | 3 | 1,87 | 4 | 1,87 | 2 | 1,58 | 9 | 5,32 | 3,00 | 1,77 |
| 4 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 5 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 6 | 4 | 2,12 | 4 | 1,87 | 4 | 2,12 | 12 | 6,11 | 4,00 | 2,04 |
| 7 | 4 | 2,12 | 4 | 1,87 | 4 | 2,12 | 12 | 6,11 | 4,00 | 2,04 |
| 8 | 5 | 2,35 | 4 | 1,87 | 4 | 2,12 | 13 | 6,34 | 4,33 | 2,11 |
| 9 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 10 | 4 | 2,12 | 4 | 1,87 | 5 | 2,35 | 13 | 6,34 | 4,33 | 2,11 |
| 11 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 12 | 5 | 2,35 | 4 | 1,87 | 4 | 2,12 | 13 | 6,34 | 4,33 | 2,11 |
| 13 | 5 | 2,35 | 4 | 1,87 | 4 | 2,12 | 13 | 6,34 | 4,33 | 2,11 |
| 14 | 5 | 2,35 | 4 | 1,87 | 4 | 2,12 | 13 | 6,34 | 4,33 | 2,11 |
| 15 | 4 | 2,12 | 4 | 1,87 | 3 | 1,87 | 11 | 5,86 | 3,67 | 1,95 |
| 16 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 17 | 4 | 2,12 | 5 | 1,87 | 3 | 1,87 | 12 | 5,86 | 4,00 | 1,95 |
| 18 | 5 | 2,35 | 4 | 1,87 | 4 | 2,12 | 13 | 6,34 | 4,33 | 2,11 |
| 19 | 4 | 2,12 | 4 | 1,87 | 3 | 1,87 | 11 | 5,86 | 3,67 | 1,95 |
| 20 | 3 | 1,87 | 4 | 1,87 | 4 | 2,12 | 11 | 5,86 | 3,67 | 1,95 |
| 21 | 4 | 2,12 | 5 | 1,87 | 4 | 2,12 | 13 | 6,11 | 4,33 | 2,04 |
| 22 | 4 | 2,12 | 4 | 1,87 | 3 | 1,87 | 11 | 5,86 | 3,67 | 1,95 |
| 23 | 4 | 2,12 | 3 | 1,87 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 24 | 4 | 2,12 | 4 | 1,87 | 4 | 2,12 | 12 | 6,11 | 4,00 | 2,04 |
| 25 | 4 | 2,12 | 2 | 1,87 | 4 | 2,12 | 10 | 6,11 | 3,33 | 2,04 |
| 26 | 4 | 2,12 | 4 | 1,87 | 4 | 2,12 | 12 | 6,11 | 4,00 | 2,04 |
| 27 | 4 | 2,12 | 4 | 1,87 | 4 | 2,12 | 12 | 6,11 | 4,00 | 2,04 |
| 28 | 4 | 2,12 | 4 | 1,87 | 4 | 2,12 | 12 | 6,11 | 4,00 | 2,04 |
| 29 | 4 | 2,12 | 4 | 1,87 | 4 | 2,12 | 12 | 6,11 | 4,00 | 2,04 |
| 30 | 5 | 2,35 | 4 | 1,87 | 4 | 2,12 | 13 | 6,34 | 4,33 | 2,11 |
| Total | 123 | 64,23 | 114,00 | 56,12 | 115,00 | 62,29 | 352,00 | 182,65 | 117,33 | 60,88 |
| Rata-rata | 4,10 | 2,14 | 3,80 | 1,87 | 3,83 | 2,08 | 11,73 | 6,09 | 3,91 | 2,03 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Panelis | Ulangan II | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 611 | | 503 | | 932 | | Jumlah | | Rata-rata | |
| 60oC | | 80oC | | 100oC | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 4 | 2,12 | 4 | 2,12 | 2 | 1,58 | 10 | 5,82 | 3,33 | 1,94 |
| 2 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 3 | 3 | 1,87 | 2 | 1,58 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 4 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 5 | 4 | 2,12 | 2 | 1,58 | 4 | 2,12 | 10 | 5,82 | 3,33 | 1,94 |
| 6 | 2 | 1,58 | 4 | 2,12 | 2 | 1,58 | 8 | 5,28 | 2,67 | 1,76 |
| 7 | 5 | 2,35 | 4 | 2,12 | 4 | 2,12 | 13 | 6,59 | 4,33 | 2,20 |
| 8 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 9 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 10 | 4 | 2,12 | 3 | 1,87 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 11 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 12 | 5 | 2,35 | 4 | 2,12 | 4 | 2,12 | 13 | 6,59 | 4,33 | 2,20 |
| 13 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 14 | 2 | 1,58 | 3 | 1,87 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 15 | 3 | 1,87 | 1 | 1,22 | 3 | 1,87 | 7 | 4,97 | 2,33 | 1,66 |
| 16 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 17 | 4 | 2,12 | 3 | 1,87 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| 18 | 4 | 2,12 | 4 | 2,12 | 2 | 1,58 | 10 | 5,82 | 3,33 | 1,94 |
| 19 | 4 | 2,12 | 2 | 1,58 | 3 | 1,87 | 9 | 5,57 | 3,00 | 1,86 |
| 20 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 21 | 4 | 2,12 | 2 | 1,58 | 3 | 1,87 | 9 | 5,57 | 3,00 | 1,86 |
| 22 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 23 | 2 | 1,58 | 3 | 1,87 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 24 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 25 | 3 | 1,87 | 2 | 1,58 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 26 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 27 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 28 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 29 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 30 | 4 | 2,12 | 3 | 1,87 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| Total | 110 | 60,96 | 96,00 | 57,29 | 100,00 | 58,34 | 306,00 | 176,59 | 102,00 | 58,86 |
| Rata-rata | 3,67 | 2,03 | 3,20 | 1,91 | 3,33 | 1,94 | 10,20 | 5,89 | 3,40 | 1,96 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Panelis | Ulangan III | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 104 | | 311 | | 235 | | Jumlah | | Rata-rata | |
| 60oC | | 80oC | | 100oC | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 3 | 1,87 | 4 | 2,12 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| 2 | 4 | 2,12 | 2 | 1,58 | 4 | 2,12 | 10 | 5,82 | 3,33 | 1,94 |
| 3 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 4 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 5 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 6 | 2 | 1,58 | 4 | 2,12 | 2 | 1,58 | 8 | 5,28 | 2,67 | 1,76 |
| 7 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 8 | 2 | 1,58 | 4 | 2,12 | 2 | 1,58 | 8 | 5,28 | 2,67 | 1,76 |
| 9 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 10 | 2 | 1,58 | 3 | 1,87 | 5 | 2,35 | 10 | 5,80 | 3,33 | 1,93 |
| 11 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 12 | 5 | 2,35 | 4 | 2,12 | 4 | 2,12 | 13 | 6,59 | 4,33 | 2,20 |
| 13 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 14 | 4 | 2,12 | 2 | 1,58 | 3 | 1,87 | 9 | 5,57 | 3,00 | 1,86 |
| 15 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 16 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 17 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 18 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 19 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| 20 | 1 | 1,22 | 3 | 1,87 | 2 | 1,58 | 6 | 4,68 | 2,00 | 1,56 |
| 21 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| 22 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 23 | 2 | 1,58 | 3 | 1,87 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 24 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 25 | 2 | 1,58 | 1 | 1,22 | 5 | 2,35 | 8 | 5,15 | 2,67 | 1,72 |
| 26 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 27 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 28 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 29 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 30 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| Total | 93 | 56,39 | 101,00 | 58,58 | 101,00 | 58,60 | 295,00 | 173,57 | 98,33 | 57,86 |
| Rata-rata | 3,10 | 1,88 | 3,37 | 1,95 | 3,37 | 1,95 | 9,83 | 5,79 | 3,28 | 1,93 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Panelis | Ulangan IV | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 454 | | 421 | | 326 | | Jumlah | | Rata-rata | |
| 60oC | | 80oC | | 100oC | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 3 | 1,87 | 4 | 2,12 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| 2 | 4 | 2,12 | 3 | 1,87 | 1 | 1,22 | 8 | 5,22 | 2,67 | 1,74 |
| 3 | 4 | 2,12 | 2 | 1,58 | 4 | 2,12 | 10 | 5,82 | 3,33 | 1,94 |
| 4 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 5 | 2 | 1,58 | 2 | 1,58 | 2 | 1,58 | 6 | 4,74 | 2,00 | 1,58 |
| 6 | 4 | 2,12 | 4 | 2,12 | 2 | 1,58 | 10 | 5,82 | 3,33 | 1,94 |
| 7 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 8 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 9 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 10 | 2 | 1,58 | 3 | 1,87 | 5 | 2,35 | 10 | 5,80 | 3,33 | 1,93 |
| 11 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 12 | 5 | 2,35 | 4 | 2,12 | 4 | 2,12 | 13 | 6,59 | 4,33 | 2,20 |
| 13 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 14 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 15 | 3 | 1,87 | 1 | 1,22 | 3 | 1,87 | 7 | 4,97 | 2,33 | 1,66 |
| 16 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 17 | 4 | 2,12 | 3 | 1,87 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| 18 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 19 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| 20 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 21 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| 22 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 23 | 2 | 1,58 | 3 | 1,87 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 24 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 25 | 2 | 1,58 | 3 | 1,87 | 5 | 2,35 | 10 | 5,80 | 3,33 | 1,93 |
| 26 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 27 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 28 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 29 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 30 | 4 | 2,12 | 3 | 1,87 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| Total | 102 | 58,87 | 99,00 | 58,08 | 101,00 | 58,39 | 302,00 | 175,34 | 100,67 | 58,45 |
| Rata-rata | 3,40 | 1,96 | 3,30 | 1,94 | 3,37 | 1,95 | 10,07 | 5,84 | 3,36 | 1,95 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Panelis | Ulangan V | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 602 | | 222 | | 453 | | Jumlah | | Rata-rata | |
| 60oC | | 80oC | | 100oC | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 2 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 3 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 4 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 5 | 4 | 2,12 | 3 | 1,87 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| 6 | 2 | 1,58 | 4 | 2,12 | 2 | 1,58 | 8 | 5,28 | 2,67 | 1,76 |
| 7 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 8 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 9 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 10 | 2 | 1,58 | 3 | 1,87 | 5 | 2,35 | 10 | 5,80 | 3,33 | 1,93 |
| 11 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 12 | 5 | 2,35 | 4 | 2,12 | 4 | 2,12 | 13 | 6,59 | 4,33 | 2,20 |
| 13 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 14 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 15 | 3 | 1,87 | 1 | 1,22 | 3 | 1,87 | 7 | 4,97 | 2,33 | 1,66 |
| 16 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 17 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 18 | 2 | 1,58 | 2 | 1,58 | 2 | 1,58 | 6 | 4,74 | 2,00 | 1,58 |
| 19 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| 20 | 4 | 2,12 | 3 | 1,87 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| 21 | 2 | 1,58 | 4 | 2,12 | 3 | 1,87 | 9 | 5,57 | 3,00 | 1,86 |
| 22 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 23 | 2 | 1,58 | 3 | 1,87 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 24 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 25 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 26 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 27 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 28 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 29 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 30 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| Total | 99 | 58,08 | 99,00 | 58,16 | 101,00 | 58,63 | 299,00 | 174,87 | 99,67 | 58,29 |
| Rata-rata | 3,30 | 1,94 | 3,30 | 1,94 | 3,37 | 1,95 | 9,97 | 5,83 | 3,32 | 1,94 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Panelis | Ulangan VI | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 831 | | 145 | | 208 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 4 | 2,12 | 4 | 2,12 | 2 | 1,58 | 10 | 5,82 | 3,33 | 1,94 |
| 2 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| 3 | 4 | 2,12 | 2 | 1,58 | 3 | 1,87 | 9 | 5,57 | 3,00 | 1,86 |
| 4 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 5 | 3 | 1,87 | 2 | 1,58 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 6 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 7 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 8 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 9 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 10 | 2 | 1,58 | 3 | 1,87 | 5 | 2,35 | 10 | 5,80 | 3,33 | 1,93 |
| 11 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 12 | 5 | 2,35 | 4 | 2,12 | 4 | 2,12 | 13 | 6,59 | 4,33 | 2,20 |
| 13 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 14 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 15 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 16 | 3 | 1,87 | 5 | 2,35 | 5 | 2,35 | 13 | 6,56 | 4,33 | 2,19 |
| 17 | 3 | 1,87 | 2 | 1,58 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 18 | 2 | 1,58 | 4 | 2,12 | 2 | 1,58 | 8 | 5,28 | 2,67 | 1,76 |
| 19 | 2 | 1,58 | 3 | 1,87 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 20 | 3 | 1,87 | 3 | 1,87 | 2 | 1,58 | 8 | 5,32 | 2,67 | 1,77 |
| 21 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| 22 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 23 | 2 | 1,58 | 3 | 1,87 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 24 | 3 | 1,87 | 2 | 1,58 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 25 | 2 | 1,58 | 2 | 1,58 | 4 | 2,12 | 8 | 5,28 | 2,67 | 1,76 |
| 26 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 27 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 28 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 29 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 30 | 3 | 1,87 | 2 | 1,58 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| Total | 96 | 57,33 | 98,00 | 57,79 | 105,00 | 59,65 | 299,00 | 174,76 | 99,67 | 58,25 |
| Rata-rata | 3,20 | 1,91 | 3,27 | 1,93 | 3,50 | 1,99 | 9,97 | 5,83 | 3,32 | 1,94 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Panelis | Ulangan VII | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 399 | | 253 | | 312 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 2 | 2 | 1,58 | 3 | 1,87 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 3 | 4 | 2,12 | 2 | 1,58 | 2 | 1,58 | 8 | 5,28 | 2,67 | 1,76 |
| 4 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 5 | 2 | 1,58 | 3 | 1,87 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 6 | 3 | 1,87 | 4 | 2,12 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| 7 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 8 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 9 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 10 | 2 | 1,58 | 3 | 1,87 | 5 | 2,35 | 10 | 5,80 | 3,33 | 1,93 |
| 11 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 12 | 5 | 2,35 | 4 | 2,12 | 4 | 2,12 | 13 | 6,59 | 4,33 | 2,20 |
| 13 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 14 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 15 | 3 | 1,87 | 5 | 2,35 | 3 | 1,87 | 11 | 6,09 | 3,67 | 2,03 |
| 16 | 2 | 1,58 | 3 | 1,87 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 17 | 2 | 1,58 | 4 | 2,12 | 4 | 2,12 | 10 | 5,82 | 3,33 | 1,94 |
| 18 | 2 | 1,58 | 2 | 1,58 | 2 | 1,58 | 6 | 4,74 | 2,00 | 1,58 |
| 19 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| 20 | 4 | 2,12 | 3 | 1,87 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| 21 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| 22 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 23 | 4 | 2,12 | 3 | 1,87 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| 24 | 3 | 1,87 | 2 | 1,58 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 25 | 3 | 1,87 | 2 | 1,58 | 5 | 2,35 | 10 | 5,80 | 3,33 | 1,93 |
| 26 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 27 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 28 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 29 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 30 | 2 | 1,58 | 4 | 2,12 | 4 | 2,12 | 10 | 5,82 | 3,33 | 1,94 |
| Total | 97 | 57,50 | 101,00 | 58,62 | 102,00 | 58,83 | 300,00 | 174,95 | 100,00 | 58,32 |
| Rata-rata | 3,23 | 1,92 | 3,37 | 1,95 | 3,40 | 1,96 | 10,00 | 5,83 | 3,33 | 1,94 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Panelis | Ulangan VIII | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 276 | | 412 | | 212 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 4 | 2,12 | 4 | 2,12 | 2 | 1,58 | 10 | 5,82 | 3,33 | 1,94 |
| 2 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| 3 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 4 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 5 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| 6 | 2 | 1,58 | 4 | 2,12 | 2 | 1,58 | 8 | 5,28 | 2,67 | 1,76 |
| 7 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 8 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 9 | 4 | 2,12 | 5 | 2,35 | 4 | 2,12 | 13 | 6,59 | 4,33 | 2,20 |
| 10 | 2 | 1,58 | 3 | 1,87 | 5 | 2,35 | 10 | 5,80 | 3,33 | 1,93 |
| 11 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 12 | 5 | 2,35 | 4 | 2,12 | 4 | 2,12 | 13 | 6,59 | 4,33 | 2,20 |
| 13 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 14 | 2 | 1,58 | 3 | 1,87 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 15 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 16 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 17 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 18 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 19 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| 20 | 3 | 1,87 | 3 | 1,87 | 2 | 1,58 | 8 | 5,32 | 2,67 | 1,77 |
| 21 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| 22 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 23 | 2 | 1,58 | 3 | 1,87 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 24 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 25 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 26 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 27 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 28 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 29 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 30 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| Total | 94 | 56,75 | 101,00 | 58,70 | 99,00 | 58,17 | 294,00 | 173,61 | 98,00 | 57,87 |
| Rata-rata | 3,13 | 1,89 | 3,37 | 1,96 | 3,30 | 1,94 | 9,80 | 5,79 | 3,27 | 1,93 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Panelis | Ulangan IX | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 109 | | 216 | | 355 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 2 | 2 | 1,58 | 2 | 1,58 | 4 | 2,12 | 8 | 5,28 | 2,67 | 1,76 |
| 3 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 4 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 5 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 6 | 2 | 1,58 | 4 | 2,12 | 2 | 1,58 | 8 | 5,28 | 2,67 | 1,76 |
| 7 | 5 | 2,35 | 3 | 1,87 | 3 | 1,87 | 11 | 6,09 | 3,67 | 2,03 |
| 8 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 9 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 10 | 2 | 1,58 | 3 | 1,87 | 5 | 2,35 | 10 | 5,80 | 3,33 | 1,93 |
| 11 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 12 | 5 | 2,35 | 4 | 2,12 | 4 | 2,12 | 13 | 6,59 | 4,33 | 2,20 |
| 13 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 14 | 2 | 1,58 | 3 | 1,87 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 15 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 16 | 3 | 1,87 | 2 | 1,58 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 17 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 18 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| 19 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| 20 | 3 | 1,87 | 3 | 1,87 | 2 | 1,58 | 8 | 5,32 | 2,67 | 1,77 |
| 21 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| 22 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 23 | 2 | 1,58 | 3 | 1,87 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 24 | 3 | 1,87 | 2 | 1,58 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 25 | 3 | 1,87 | 3 | 1,87 | 5 | 2,35 | 11 | 6,09 | 3,67 | 2,03 |
| 26 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 27 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 28 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 29 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 30 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| Total | 93 | 56,47 | 93,00 | 56,64 | 108,00 | 60,41 | 294,00 | 173,52 | 98,00 | 57,84 |
| Rata-rata | 3,10 | 1,88 | 3,10 | 1,89 | 3,60 | 2,01 | 9,80 | 5,78 | 3,27 | 1,93 |

Data Asli Makaroni Cassava Koro Terhadap Rasa

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Kelompok ulangan | Suhu Pengukusan Makaroni | | | Total kelompok |
| a1 | a2 | a3 |
| 1 | 4,10 | 4,10 | 3,83 | 12,03 |
| 2 | 3,67 | 3,20 | 3,33 | 10,20 |
| 3 | 3,10 | 3,37 | 3,37 | 9,83 |
| 4 | 3,40 | 3,30 | 3,37 | 10,07 |
| 5 | 3,30 | 3,30 | 3,37 | 9,97 |
| 6 | 3,20 | 3,27 | 3,50 | 9,97 |
| 7 | 3,23 | 3,37 | 3,40 | 10,00 |
| 8 | 3,13 | 3,37 | 3,30 | 9,80 |
| 9 | 3,10 | 3,10 | 3,60 | 9,80 |
| Total perlakuan | 30,23 | 30,37 | 31,07 | 91,67 |
| Rata-rata | 3,36 | 3,37 | 3,45 | 10,19 |

Data Transportasi Makaroni Cassava Koro terhadap rasa

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Kelompok ulangan | Suhu Pengukusan Makaroni | | | Total kelompok |
| a1 | a2 | a3 |
| 1 | 2,14 | 1,87 | 2,08 | 6,09 |
| 2 | 2,03 | 1,91 | 1,94 | 5,89 |
| 3 | 1,88 | 1,95 | 1,95 | 5,79 |
| 4 | 1,96 | 1,94 | 1,95 | 5,84 |
| 5 | 1,94 | 1,94 | 1,95 | 5,83 |
| 6 | 1,91 | 1,93 | 1,99 | 5,83 |
| 7 | 1,92 | 1,95 | 1,96 | 5,83 |
| 8 | 1,89 | 1,96 | 1,94 | 5,79 |
| 9 | 1,88 | 1,89 | 2,01 | 5,78 |
| Total perlakuan | 17,55 | 17,33 | 17,78 | 52,66 |
| Rata-rata | 1,95 | 1,93 | 1,98 | 10,53 |

Perhitungan ANAVA

Faktor Koreksi (FK) =

=

= 102,71

JK Total (JKT) = - FK

= – 102,71

= 0,0937

JK Kelompok (JKK) = - FK

= – 102,71

= 0,0240

JK Perlakuan (JKP) = - FK

= – 102,71

= 0,0110

JK Galat (JKG) = JKT – JKK- JKP

= 0,0937 – 0,0240 – 0,0110

= 0,0587

Tabel ANAVA Uji Organoleptik Terhadap Rasa

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variansi** | **Db** | **JK** | **KT** | **F Hitung** | **F Tabel** |
| **Kelompok** | 8 | 0,0240 | 0,0030 |  |  |
| **Perlakuan** | 2 | 0,0110 | 0,0055 | 1,500tn | 3,63 |
| **Galat** | 16 | 0,0587 | 0,0037 |  |  |
| **Total** | 26 | 0,0937 |  |  |  |

tn) Tidak Berpengaruh Nyata

Kesimpulan :

Berdasarkan Tabel ANAVA diatas, F Hitung ≥ F tabel pada taraf 5 % maka dapat disimpulkan bahwa perlakuan suhu pengukusan makaroni tidak berpengaruh terhadap rasa makaroni sehingga tidak perlu dilakukan uji lanjut.

Tabel Hasil Uji Organoleptik Makaroni Cassava Koro Terhadap Parameter Tekstur

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Panelis | Ulangan I | | | | | | | | | |
| Suhu Pengukusan Makaroni Cassava Koro | | | | | | | | | |
| 512 | | 134 | | 383 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 2 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| 3 | 2 | 1,58 | 2 | 1,58 | 2 | 1,58 | 6 | 4,74 | 2,00 | 1,58 |
| 4 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 5 | 2 | 1,58 | 2 | 1,58 | 2 | 1,58 | 6 | 4,74 | 2,00 | 1,58 |
| 6 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 7 | 2 | 1,58 | 4 | 2,12 | 4 | 2,12 | 10 | 5,82 | 3,33 | 1,94 |
| 8 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 9 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 10 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 11 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 12 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 13 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 14 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 15 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 16 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 17 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 18 | 2 | 1,58 | 2 | 1,58 | 4 | 2,12 | 8 | 5,28 | 2,67 | 1,76 |
| 19 | 1 | 1,22 | 2 | 1,58 | 4 | 2,12 | 7 | 4,93 | 2,33 | 1,64 |
| 20 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 21 | 3 | 1,87 | 2 | 1,58 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 22 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 23 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 24 | 2 | 1,58 | 2 | 1,58 | 4 | 2,12 | 8 | 5,28 | 2,67 | 1,76 |
| 25 | 2 | 1,58 | 2 | 1,58 | 4 | 2,12 | 8 | 5,28 | 2,67 | 1,76 |
| 26 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 27 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 28 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 29 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 30 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| Total | 85 | 54,30 | 96,00 | 57,31 | 110,00 | 60,88 | 291,00 | 172,49 | 97,00 | 57,50 |
| Rata-rata | 2,83 | 1,81 | 3,20 | 1,91 | 3,67 | 2,03 | 9,70 | 5,75 | 3,23 | 1,92 |

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| Panelis | Ulangan II | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 611 | | 503 | | 932 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 2 | 4 | 2,12 | 2 | 1,58 | 3 | 1,87 | 9 | 5,57 | 3,00 | 1,86 |
| 3 | 2 | 1,58 | 2 | 1,58 | 2 | 1,58 | 6 | 4,74 | 2,00 | 1,58 |
| 4 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 5 | 2 | 1,58 | 2 | 1,58 | 2 | 1,58 | 6 | 4,74 | 2,00 | 1,58 |
| 6 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 7 | 5 | 2,35 | 3 | 1,87 | 5 | 2,35 | 13 | 6,56 | 4,33 | 2,19 |
| 8 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 9 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 10 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 11 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 12 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 13 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 14 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 15 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 16 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 17 | 2 | 1,58 | 2 | 1,58 | 4 | 2,12 | 8 | 5,28 | 2,67 | 1,76 |
| 18 | 2 | 1,58 | 3 | 1,87 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 19 | 1 | 1,22 | 2 | 1,58 | 4 | 2,12 | 7 | 4,93 | 2,33 | 1,64 |
| 20 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 21 | 3 | 1,87 | 2 | 1,58 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 22 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 23 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 24 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 25 | 3 | 1,87 | 2 | 1,58 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 26 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 27 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 28 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 29 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 30 | 2 | 1,58 | 2 | 1,58 | 4 | 2,12 | 8 | 5,28 | 2,67 | 1,76 |
| Total | 92 | 56,18 | 94,00 | 56,81 | 109,00 | 60,59 | 295,00 | 173,59 | 98,33 | 57,86 |
| Rata-rata | 3,07 | 1,87 | 3,13 | 1,89 | 3,63 | 2,02 | 9,83 | 5,79 | 3,28 | 1,93 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Panelis | Ulangan III | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 104 | | 311 | | 235 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 2 | 2 | 1,58 | 3 | 1,87 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 3 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| 4 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 5 | 2 | 1,58 | 1 | 1,22 | 3 | 1,87 | 6 | 4,68 | 2,00 | 1,56 |
| 6 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 7 | 2 | 1,58 | 3 | 1,87 | 5 | 2,35 | 10 | 5,80 | 3,33 | 1,93 |
| 8 | 2 | 1,58 | 3 | 1,87 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 9 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 10 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 11 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 12 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 13 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 14 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 15 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 16 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 17 | 4 | 2,12 | 3 | 1,87 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 18 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 19 | 1 | 1,22 | 2 | 1,58 | 4 | 2,12 | 7 | 4,93 | 2,33 | 1,64 |
| 20 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 21 | 3 | 1,87 | 2 | 1,58 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 22 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 23 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 24 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 25 | 1 | 1,22 | 2 | 1,58 | 5 | 2,35 | 8 | 5,15 | 2,67 | 1,72 |
| 26 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 27 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 28 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 29 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 30 | 4 | 2,12 | 3 | 1,87 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| Total | 86 | 54,56 | 95,00 | 57,08 | 113,00 | 61,59 | 294,00 | 173,23 | 98,00 | 57,74 |
| Rata-rata | 2,87 | 1,82 | 3,17 | 1,90 | 3,77 | 2,05 | 9,80 | 5,77 | 3,27 | 1,92 |

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| Panelis | Ulangan IV | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 454 | | 421 | | 326 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 2 | 4 | 2,12 | 4 | 2,12 | 2 | 1,58 | 10 | 5,82 | 3,33 | 1,94 |
| 3 | 3 | 1,87 | 2 | 1,58 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 4 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 5 | 3 | 1,87 | 2 | 1,58 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 6 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 7 | 3 | 1,87 | 2 | 1,58 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 8 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 9 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 10 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 11 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 12 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 13 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 14 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 15 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 16 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 17 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 18 | 2 | 1,58 | 2 | 1,58 | 2 | 1,58 | 6 | 4,74 | 2,00 | 1,58 |
| 19 | 1 | 1,22 | 2 | 1,58 | 4 | 2,12 | 7 | 4,93 | 2,33 | 1,64 |
| 20 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 21 | 3 | 1,87 | 2 | 1,58 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 22 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 23 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 24 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 25 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 26 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 27 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 28 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 29 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 30 | 4 | 2,12 | 2 | 1,58 | 4 | 2,12 | 10 | 5,82 | 3,33 | 1,94 |
| Total | 94 | 56,82 | 95,00 | 57,10 | 109,00 | 60,53 | 298,00 | 174,46 | 99,33 | 58,15 |
| Rata-rata | 3,13 | 1,89 | 3,17 | 1,90 | 3,63 | 2,02 | 9,93 | 5,82 | 3,31 | 1,94 |

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| Panelis | Ulangan V | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 602 | | 222 | | 453 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 4 | 2,12 | 5 | 2,35 | 4 | 2,12 | 13 | 6,59 | 4,33 | 2,20 |
| 2 | 2 | 1,58 | 4 | 2,12 | 4 | 2,12 | 10 | 5,82 | 3,33 | 1,94 |
| 3 | 2 | 1,58 | 3 | 1,87 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 4 | 4 | 2,12 | 1 | 1,22 | 4 | 2,12 | 9 | 5,47 | 3,00 | 1,82 |
| 5 | 2 | 1,58 | 3 | 1,87 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 6 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 7 | 3 | 1,87 | 2 | 1,58 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 8 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 9 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 10 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 11 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 12 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 13 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 14 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 15 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 16 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 17 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 18 | 2 | 1,58 | 2 | 1,58 | 2 | 1,58 | 6 | 4,74 | 2,00 | 1,58 |
| 19 | 1 | 1,22 | 2 | 1,58 | 4 | 2,12 | 7 | 4,93 | 2,33 | 1,64 |
| 20 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 21 | 3 | 1,87 | 2 | 1,58 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 22 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 23 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 24 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 25 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 26 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 27 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 28 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 29 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 30 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| Total | 87 | 54,91 | 98,00 | 57,80 | 111,00 | 61,13 | 296,00 | 173,85 | 98,67 | 57,95 |
| Rata-rata | 2,90 | 1,83 | 3,27 | 1,93 | 3,70 | 2,04 | 9,87 | 5,79 | 3,29 | 1,93 |

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| Panelis | Ulangan VI | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 831 | | 145 | | 208 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 2 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 3 | 4 | 2,12 | 2 | 1,58 | 2 | 1,58 | 8 | 5,28 | 2,67 | 1,76 |
| 4 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 5 | 1 | 1,22 | 3 | 1,87 | 4 | 2,12 | 8 | 5,22 | 2,67 | 1,74 |
| 6 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 7 | 2 | 1,58 | 2 | 1,58 | 4 | 2,12 | 8 | 5,28 | 2,67 | 1,76 |
| 8 | 3 | 1,87 | 2 | 1,58 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 9 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 10 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 11 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 12 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 13 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 14 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 15 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 16 | 4 | 2,12 | 3 | 1,87 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 17 | 2 | 1,58 | 2 | 1,58 | 4 | 2,12 | 8 | 5,28 | 2,67 | 1,76 |
| 18 | 2 | 1,58 | 2 | 1,58 | 2 | 1,58 | 6 | 4,74 | 2,00 | 1,58 |
| 19 | 1 | 1,22 | 2 | 1,58 | 4 | 2,12 | 7 | 4,93 | 2,33 | 1,64 |
| 20 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 21 | 3 | 1,87 | 2 | 1,58 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 22 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 23 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 24 | 3 | 1,87 | 2 | 1,58 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 25 | 2 | 1,58 | 2 | 1,58 | 5 | 2,35 | 9 | 5,51 | 3,00 | 1,84 |
| 26 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 27 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 28 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 29 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 30 | 2 | 1,58 | 2 | 1,58 | 4 | 2,12 | 8 | 5,28 | 2,67 | 1,76 |
| Total | 87 | 54,77 | 92,00 | 56,23 | 116,00 | 62,33 | 295,00 | 173,34 | 98,33 | 57,78 |
| Rata-rata | 2,90 | 1,83 | 3,07 | 1,87 | 3,87 | 2,08 | 9,83 | 5,78 | 3,28 | 1,93 |

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| Panelis | Ulangan VII | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 399 | | 253 | | 312 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 2 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 3 | 2 | 1,58 | 3 | 1,87 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 4 | 2 | 1,58 | 3 | 1,87 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 5 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| 6 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 7 | 2 | 1,58 | 3 | 1,87 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 8 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 9 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 10 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 11 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 12 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 13 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 14 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 15 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 16 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 17 | 2 | 1,58 | 3 | 1,87 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 18 | 2 | 1,58 | 2 | 1,58 | 2 | 1,58 | 6 | 4,74 | 2,00 | 1,58 |
| 19 | 1 | 1,22 | 2 | 1,58 | 4 | 2,12 | 7 | 4,93 | 2,33 | 1,64 |
| 20 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 21 | 3 | 1,87 | 2 | 1,58 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 22 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 23 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 24 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 25 | 1 | 1,22 | 2 | 1,58 | 4 | 2,12 | 7 | 4,93 | 2,33 | 1,64 |
| 26 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 27 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 28 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 29 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 30 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| Total | 84 | 53,98 | 95,00 | 57,14 | 107,00 | 60,16 | 286,00 | 171,28 | 95,33 | 57,09 |
| Rata-rata | 2,80 | 1,80 | 3,17 | 1,90 | 3,57 | 2,01 | 9,53 | 5,71 | 3,18 | 1,90 |

|  |  |  |  |  |  |  |  |  |  |  |
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| Panelis | Ulangan VIII | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 276 | | 412 | | 212 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 2 | 2 | 1,58 | 3 | 1,87 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 3 | 2 | 1,58 | 3 | 1,87 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 4 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 5 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| 6 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 7 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| 8 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 9 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 10 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 11 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 12 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 13 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 14 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 15 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 16 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 17 | 2 | 1,58 | 3 | 1,87 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 18 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 19 | 1 | 1,22 | 2 | 1,58 | 4 | 2,12 | 7 | 4,93 | 2,33 | 1,64 |
| 20 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 21 | 3 | 1,87 | 2 | 1,58 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 22 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 23 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 24 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 25 | 2 | 1,58 | 1 | 1,22 | 4 | 2,12 | 7 | 4,93 | 2,33 | 1,64 |
| 26 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 27 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 28 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 29 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 30 | 2 | 1,58 | 3 | 1,87 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| Total | 88 | 55,13 | 99,00 | 58,08 | 109,00 | 60,70 | 296,00 | 173,90 | 98,67 | 57,97 |
| Rata-rata | 2,93 | 1,84 | 3,30 | 1,94 | 3,63 | 2,02 | 9,87 | 5,80 | 3,29 | 1,93 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Panelis | Ulangan IX | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 109 | | 216 | | 355 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 2 | 2 | 1,58 | 2 | 1,58 | 3 | 1,87 | 7 | 5,03 | 2,33 | 1,68 |
| 3 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 4 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 5 | 2 | 1,58 | 1 | 1,22 | 3 | 1,87 | 6 | 4,68 | 2,00 | 1,56 |
| 6 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 7 | 2 | 1,58 | 3 | 1,87 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 8 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 9 | 4 | 2,12 | 5 | 2,35 | 4 | 2,12 | 13 | 6,59 | 4,33 | 2,20 |
| 10 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 11 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 12 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 13 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 14 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 15 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 16 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 17 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 18 | 2 | 1,58 | 2 | 1,58 | 5 | 2,35 | 9 | 5,51 | 3,00 | 1,84 |
| 19 | 1 | 1,22 | 2 | 1,58 | 4 | 2,12 | 7 | 4,93 | 2,33 | 1,64 |
| 20 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 21 | 3 | 1,87 | 2 | 1,58 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 22 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 23 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 24 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 25 | 3 | 1,87 | 2 | 1,58 | 5 | 2,35 | 10 | 5,80 | 3,33 | 1,93 |
| 26 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 27 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 28 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 29 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 30 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| Total | 91 | 55,96 | 97,00 | 57,51 | 113,00 | 61,69 | 301,00 | 175,15 | 100,33 | 58,38 |
| Rata-rata | 3,03 | 1,87 | 3,23 | 1,92 | 3,77 | 2,06 | 10,03 | 5,84 | 3,34 | 1,95 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data Asli Makaroni Cassava Koro Terhadap Tekstur (Kekenyalan) | | | | |
| Kelompok ulangan | Suhu Pengukusan Makaroni | | | Total kelompok |
| a1 | a2 | a3 |
| 1 | 2,83 | 2,83 | 3,67 | 9,33 |
| 2 | 3,07 | 3,13 | 3,63 | 9,83 |
| 3 | 2,87 | 3,17 | 3,77 | 9,80 |
| 4 | 3,13 | 3,17 | 3,63 | 9,93 |
| 5 | 2,90 | 3,27 | 3,70 | 9,87 |
| 6 | 2,90 | 3,07 | 3,87 | 9,83 |
| 7 | 2,80 | 3,17 | 3,57 | 9,53 |
| 8 | 2,93 | 3,30 | 3,63 | 9,87 |
| 9 | 3,03 | 3,23 | 3,77 | 10,03 |
| Total perlakuan | 26,47 | 28,33 | 33,23 | 88,03 |
| Rata-rata | 2,94 | 3,15 | 3,69 | 9,78 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data transformasi Makaroni Cassava Koro Terhadap Tekstur (Kekenyalan) | | | | |
| Kelompok ulangan | Suhu Pengukusan Makaroni | | | Total Kelompok |
| a1 | a2 | a3 |
| 1 | 1,81 | 1,91 | 2,03 | 5,75 |
| 2 | 1,87 | 1,89 | 2,02 | 5,79 |
| 3 | 1,82 | 1,90 | 2,05 | 5,77 |
| 4 | 1,89 | 1,90 | 2,02 | 5,82 |
| 5 | 1,83 | 1,93 | 2,04 | 5,79 |
| 6 | 1,83 | 1,87 | 2,08 | 5,78 |
| 7 | 1,80 | 1,90 | 2,01 | 5,71 |
| 8 | 1,84 | 1,94 | 2,02 | 5,80 |
| 9 | 1,87 | 1,92 | 2,06 | 5,84 |
| Total perlakuan | 16,55 | 17,17 | 18,32 | 52,04 |
| Rata-rata | 1,84 | 1,91 | 2,04 | 10,41 |

Perhitungan ANAVA

Faktor Koreksi (FK) =

=

= 100,31

JK Total (JKT) = - FK

= – 100,31

= 0,1936

JK Kelompok (JKK) = - FK

= – 100,31

= 0,0037

JK Perlakuan (JKP) = - FK

= – 100,31

= 0,1788

JK Galat (JKG) = JKT – JKK- JKP

= 0,1936 – 0,0037 – 0,1788

= 0,0111

Tabel ANAVA Uji Organoleptik Terhadap Tekstur

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variansi | Db | JK | KT | F Hitung | F Tabel |
| Kelompok | 8 | 0,0037 | 0,0005 | - | - |
| Perlakuan | 2 | 0,1788 | 0,0894 | 129,30 \* | 3,63 |
| Galat | 16 | 0,0111 | 0,0007 |  |  |
| Total | 26 | 0,1936 |  |  |  |

\*) Berpengaruh Nyata

Kesimpulan :

Berdasarkan Tabel ANAVA diatas, F Hitung lebih besar dibandingkan F tabel pada taraf 5 % maka dapat disimpulkan bahwa perlakuan suhu pengukusan makaroni berpengaruh terhadap Tekstur makaroni sehingga perlu dilakukan uji lanjut. Uji lanjut yang digunakan adalah uji lanjut Duncan.

**Perhitungan Uji Lanjut Duncan**

Sy = = = 0,0088

Uji Lanjut Duncan Terhadap Tekstur Makaroni Cassava Koro

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Kode Sampel | Rata-rata Perlakuan | Perlakuan | | | | | Taraf Nyata |
| 1 | | 2 | | 3 |
| - | - | a1 | 1,84 | - |  | - |  | - | a |
| 3,00 | 0,0263 | a2 | 1,91 | 0,07 | \* | - |  | - | b |
| 3,15 | 0,0276 | a3 | 2,04 | 0,20 | \* | 0,13 | \* | - | c |

Keterangan : \*) Berbeda nyata tn) tidak berbeda nyata

Data Hasil Uji Lanjut Duncan Terhadap Tekstur Makaroni Cassava Koro

|  |  |  |
| --- | --- | --- |
| Perlakuan Suhu Pengukusan Makaroni | Nilai Asli Rata- Rata Tekstur | Taraf Nyata 5% |
| a1 (60oC) | 2,94 | a |
| a2 (80oC) | 3,15 | b |
| a3 (100oC) | 3,69 | c |

Kesimpulan :

Berdasarkan tabel hasil uji lanjut Duncan dapat disimpulkan bahwa terjadi peningkatan kesukaan terhadap tekstur makaroni yang nyata pada perlakuan a1 terhadap a2 dan a3.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Panelis | Ulangan I | | | | | | | | | |
| Suhu Pengukusan Makaroni Cassava Koro | | | | | | | | | |
| 512 | | 134 | | 383 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 3 | 1,87 | 4 | 2,12 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| 2 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 3 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 4 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 5 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 6 | 2 | 1,58 | 4 | 2,12 | 3 | 1,87 | 9 | 5,57 | 3,00 | 1,86 |
| 7 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 8 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 9 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 10 | 5 | 2,35 | 3 | 1,87 | 5 | 2,35 | 13 | 6,56 | 4,33 | 2,19 |
| 11 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 12 | 3 | 1,87 | 4 | 2,12 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| 13 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 14 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 15 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 16 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 17 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 18 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 19 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 20 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 21 | 4 | 2,12 | 2 | 1,58 | 2 | 1,58 | 8 | 5,28 | 2,67 | 1,76 |
| 22 | 3 | 1,87 | 2 | 1,58 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 23 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 24 | 3 | 1,87 | 2 | 1,58 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 25 | 2 | 1,58 | 2 | 1,58 | 4 | 2,12 | 8 | 5,28 | 2,67 | 1,76 |
| 26 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 27 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 28 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 29 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 30 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| Total | 97 | 57,77 | 96,00 | 57,47 | 98,00 | 57,96 | 291,00 | 173,20 | 97,00 | 57,73 |
| Rata-rata | 3,23 | 1,93 | 3,20 | 1,92 | 3,27 | 1,93 | 9,70 | 5,77 | 3,23 | 1,92 |

|  |  |  |  |  |  |  |  |  |  |  |
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| Panelis | Ulangan II | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 611 | | 503 | | 932 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 3 | 1,87 | 4 | 2,12 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| 2 | 2 | 1,58 | 1 | 1,22 | 2 | 1,58 | 5 | 4,39 | 1,67 | 1,46 |
| 3 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 4 | 3 | 1,87 | 3 | 1,87 | 2 | 1,58 | 8 | 5,32 | 2,67 | 1,77 |
| 5 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 6 | 2 | 1,58 | 4 | 2,12 | 3 | 1,87 | 9 | 5,57 | 3,00 | 1,86 |
| 7 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 8 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 9 | 4 | 2,12 | 3 | 1,87 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 10 | 5 | 2,35 | 4 | 2,12 | 5 | 2,35 | 14 | 6,81 | 4,67 | 2,27 |
| 11 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 12 | 3 | 1,87 | 4 | 2,12 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| 13 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 14 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 15 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 16 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 17 | 2 | 1,58 | 3 | 1,87 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 18 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 19 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 20 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 21 | 4 | 2,12 | 2 | 1,58 | 2 | 1,58 | 8 | 5,28 | 2,67 | 1,76 |
| 22 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 23 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 24 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 25 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 26 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 27 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 28 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 29 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 30 | 2 | 1,58 | 3 | 1,87 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| Total | 94 | 56,94 | 95,00 | 57,19 | 99,00 | 58,13 | 288,00 | 172,27 | 96,00 | 57,42 |
| Rata-rata | 3,13 | 1,90 | 3,17 | 1,91 | 3,30 | 1,94 | 9,60 | 5,74 | 3,20 | 1,91 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Panelis | Ulangan III | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 104 | | 311 | | 235 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 3 | 1,87 | 4 | 2,12 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| 2 | 3 | 1,87 | 2 | 1,58 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 3 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 4 | 3 | 1,87 | 3 | 1,87 | 2 | 1,58 | 8 | 5,32 | 2,67 | 1,77 |
| 5 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 6 | 2 | 1,58 | 4 | 2,12 | 3 | 1,87 | 9 | 5,57 | 3,00 | 1,86 |
| 7 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 8 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 9 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 10 | 5 | 2,35 | 4 | 2,12 | 5 | 2,35 | 14 | 6,81 | 4,67 | 2,27 |
| 11 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 12 | 3 | 1,87 | 4 | 2,12 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| 13 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 14 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 15 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 16 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 17 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 18 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 19 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 20 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 21 | 4 | 2,12 | 2 | 1,58 | 2 | 1,58 | 8 | 5,28 | 2,67 | 1,76 |
| 22 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 23 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 24 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 25 | 2 | 1,58 | 1 | 1,22 | 5 | 2,35 | 8 | 5,15 | 2,67 | 1,72 |
| 26 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 27 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 28 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 29 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 30 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| Total | 97 | 57,77 | 95,00 | 57,15 | 98,00 | 57,88 | 290,00 | 172,81 | 96,67 | 57,60 |
| Rata-rata | 3,23 | 1,93 | 3,17 | 1,91 | 3,27 | 1,93 | 9,67 | 5,76 | 3,22 | 1,92 |

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| Panelis | Ulangan IV | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 454 | | 421 | | 326 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 3 | 1,87 | 4 | 2,12 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| 2 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 3 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 4 | 3 | 1,87 | 2 | 1,58 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 5 | 3 | 1,87 | 2 | 1,58 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 6 | 2 | 1,58 | 4 | 2,12 | 3 | 1,87 | 9 | 5,57 | 3,00 | 1,86 |
| 7 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 8 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 9 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 10 | 5 | 2,35 | 4 | 2,12 | 5 | 2,35 | 14 | 6,81 | 4,67 | 2,27 |
| 11 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 12 | 3 | 1,87 | 4 | 2,12 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| 13 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 14 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 15 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 16 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 17 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 18 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 19 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 20 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 21 | 4 | 2,12 | 2 | 1,58 | 2 | 1,58 | 8 | 5,28 | 2,67 | 1,76 |
| 22 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 23 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 24 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 25 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 26 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 27 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 28 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 29 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 30 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| Total | 97 | 57,77 | 99,00 | 58,26 | 99,00 | 58,17 | 295,00 | 174,20 | 98,33 | 58,07 |
| Rata-rata | 3,23 | 1,93 | 3,30 | 1,94 | 3,30 | 1,94 | 9,83 | 5,81 | 3,28 | 1,94 |

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| Panelis | Ulangan V | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 602 | | 222 | | 453 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 2 | 1,87 | 4 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 2 | 3 | 1,87 | 4 | 1,58 | 2 | 1,87 | 9 | 5,32 | 3,00 | 1,77 |
| 3 | 3 | 1,87 | 3 | 1,87 | 3 | 2,12 | 9 | 5,86 | 3,00 | 1,95 |
| 4 | 3 | 1,87 | 3 | 2,35 | 3 | 1,87 | 9 | 6,09 | 3,00 | 2,03 |
| 5 | 3 | 1,87 | 3 | 2,12 | 3 | 1,87 | 9 | 5,86 | 3,00 | 1,95 |
| 6 | 2 | 1,87 | 4 | 1,87 | 3 | 2,12 | 9 | 5,86 | 3,00 | 1,95 |
| 7 | 3 | 2,12 | 3 | 2,35 | 4 | 2,35 | 10 | 6,82 | 3,33 | 2,27 |
| 8 | 4 | 1,87 | 4 | 1,87 | 4 | 2,12 | 12 | 5,86 | 4,00 | 1,95 |
| 9 | 4 | 2,12 | 3 | 1,87 | 5 | 2,12 | 12 | 6,11 | 4,00 | 2,04 |
| 10 | 5 | 1,87 | 4 | 1,87 | 5 | 2,12 | 14 | 5,86 | 4,67 | 1,95 |
| 11 | 3 | 1,87 | 3 | 1,87 | 3 | 2,12 | 9 | 5,86 | 3,00 | 1,95 |
| 12 | 3 | 2,35 | 4 | 2,12 | 2 | 2,12 | 9 | 6,59 | 3,00 | 2,20 |
| 13 | 3 | 2,35 | 3 | 2,12 | 3 | 2,12 | 9 | 6,59 | 3,00 | 2,20 |
| 14 | 4 | 2,12 | 4 | 2,12 | 3 | 2,12 | 11 | 6,36 | 3,67 | 2,12 |
| 15 | 3 | 1,87 | 3 | 1,87 | 4 | 1,87 | 10 | 5,61 | 3,33 | 1,87 |
| 16 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 17 | 3 | 2,12 | 3 | 2,12 | 3 | 2,12 | 9 | 6,36 | 3,00 | 2,12 |
| 18 | 3 | 2,12 | 3 | 2,12 | 3 | 2,12 | 9 | 6,36 | 3,00 | 2,12 |
| 19 | 3 | 2,12 | 3 | 2,12 | 3 | 2,12 | 9 | 6,36 | 3,00 | 2,12 |
| 20 | 3 | 2,12 | 3 | 2,12 | 3 | 1,58 | 9 | 5,82 | 3,00 | 1,94 |
| 21 | 4 | 1,87 | 2 | 1,87 | 2 | 1,87 | 8 | 5,61 | 2,67 | 1,87 |
| 22 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 23 | 3 | 1,58 | 4 | 1,58 | 4 | 1,22 | 11 | 4,38 | 3,67 | 1,46 |
| 24 | 4 | 1,87 | 3 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 25 | 3 | 2,12 | 3 | 2,12 | 4 | 2,12 | 10 | 6,36 | 3,33 | 2,12 |
| 26 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 27 | 3 | 1,58 | 3 | 1,22 | 4 | 1,22 | 10 | 4,02 | 3,33 | 1,34 |
| 28 | 4 | 1,87 | 4 | 2,12 | 4 | 2,12 | 12 | 6,11 | 4,00 | 2,04 |
| 29 | 4 | 1,87 | 4 | 1,87 | 4 | 1,87 | 12 | 5,61 | 4,00 | 1,87 |
| 30 | 3 | 2,12 | 3 | 2,12 | 3 | 1,87 | 9 | 6,11 | 3,00 | 2,04 |
| Total | 97 | 58,73 | 99,00 | 58,83 | 99,00 | 58,49 | 295,00 | 176,05 | 98,33 | 58,68 |
| Rata-rata | 3,23 | 1,96 | 3,30 | 1,96 | 3,30 | 1,95 | 9,83 | 5,87 | 3,28 | 1,96 |

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| Panelis | Ulangan VI | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 831 | | 145 | | 208 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 3 | 1,87 | 4 | 2,12 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| 2 | 2 | 1,58 | 3 | 1,87 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 3 | 2 | 1,58 | 3 | 1,87 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 4 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 5 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 6 | 2 | 1,58 | 4 | 2,12 | 3 | 1,87 | 9 | 5,57 | 3,00 | 1,86 |
| 7 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 8 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 9 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 10 | 5 | 2,35 | 4 | 2,12 | 5 | 2,35 | 14 | 6,81 | 4,67 | 2,27 |
| 11 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 12 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 13 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 14 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 15 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 16 | 2 | 1,58 | 3 | 1,87 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 17 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 18 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 19 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 20 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 21 | 4 | 2,12 | 2 | 1,58 | 2 | 1,58 | 8 | 5,28 | 2,67 | 1,76 |
| 22 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 23 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 24 | 3 | 1,87 | 2 | 1,58 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 25 | 2 | 1,58 | 2 | 1,58 | 4 | 2,12 | 8 | 5,28 | 2,67 | 1,76 |
| 26 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 27 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 28 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 29 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 30 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| Total | 96 | 57,41 | 96,00 | 57,51 | 101,00 | 58,64 | 293,00 | 173,56 | 97,67 | 57,85 |
| Rata-rata | 3,20 | 1,91 | 3,20 | 1,92 | 3,37 | 1,95 | 9,77 | 5,79 | 3,26 | 1,93 |

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| Panelis | Ulangan VII | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 399 | | 253 | | 312 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 3 | 1,87 | 4 | 2,12 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| 2 | 2 | 1,58 | 3 | 1,87 | 2 | 1,58 | 7 | 5,03 | 2,33 | 1,68 |
| 3 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 4 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 5 | 2 | 1,58 | 3 | 1,87 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 6 | 2 | 1,58 | 4 | 2,12 | 3 | 1,87 | 9 | 5,57 | 3,00 | 1,86 |
| 7 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 8 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 9 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 10 | 5 | 2,35 | 4 | 2,12 | 5 | 2,35 | 14 | 6,81 | 4,67 | 2,27 |
| 11 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 12 | 3 | 1,87 | 4 | 2,12 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| 13 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 14 | 4 | 2,12 | 4 | 2,12 | 3 | 1,87 | 11 | 6,11 | 3,67 | 2,04 |
| 15 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 16 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 17 | 3 | 1,87 | 2 | 1,58 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 18 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 19 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 20 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 21 | 2 | 1,58 | 4 | 2,12 | 2 | 1,58 | 8 | 5,28 | 2,67 | 1,76 |
| 22 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 23 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 24 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 25 | 2 | 1,58 | 2 | 1,58 | 4 | 2,12 | 8 | 5,28 | 2,67 | 1,76 |
| 26 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 27 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 28 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 29 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 30 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| Total | 93 | 56,65 | 99,00 | 58,30 | 101,00 | 58,67 | 293,00 | 173,62 | 97,67 | 57,87 |
| Rata-rata | 3,10 | 1,89 | 3,30 | 1,94 | 3,37 | 1,96 | 9,77 | 5,79 | 3,26 | 1,93 |

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| Panelis | Ulangan VIII | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 276 | | 412 | | 212 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 3 | 1,87 | 4 | 2,12 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| 2 | 3 | 1,87 | 3 | 1,87 | 2 | 1,58 | 8 | 5,32 | 2,67 | 1,77 |
| 3 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 4 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 5 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 6 | 2 | 1,58 | 4 | 2,12 | 3 | 1,87 | 9 | 5,57 | 3,00 | 1,86 |
| 7 | 4 | 2,12 | 3 | 1,87 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 8 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 9 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 10 | 5 | 2,35 | 4 | 2,12 | 5 | 2,35 | 14 | 6,81 | 4,67 | 2,27 |
| 11 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 12 | 3 | 1,87 | 4 | 2,12 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| 13 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 14 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 15 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 16 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 17 | 2 | 1,58 | 2 | 1,58 | 4 | 2,12 | 8 | 5,28 | 2,67 | 1,76 |
| 18 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 19 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 20 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 21 | 4 | 2,12 | 2 | 1,58 | 2 | 1,58 | 8 | 5,28 | 2,67 | 1,76 |
| 22 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 23 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 24 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 25 | 2 | 1,58 | 3 | 1,87 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 26 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 27 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 28 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 29 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 30 | 2 | 1,58 | 2 | 1,58 | 4 | 2,12 | 8 | 5,28 | 2,67 | 1,76 |
| Total | 94 | 56,94 | 95,00 | 57,26 | 100,00 | 58,45 | 289,00 | 172,65 | 96,33 | 57,55 |
| Rata-rata | 3,13 | 1,90 | 3,17 | 1,91 | 3,33 | 1,95 | 9,63 | 5,75 | 3,21 | 1,92 |

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| Panelis | Ulangan IX | | | | | | | | | |
| Suhu Pengukusan Makaroni | | | | | | | | | |
| 109 | | 216 | | 355 | | Jumlah | | Rata-rata | |
| a1 | | a2 | | a3 | |
| DA | DT | DA | DT | DA | DT | DA | DT | DA | DT |
| 1 | 3 | 1,87 | 4 | 2,12 | 5 | 2,35 | 12 | 6,34 | 4,00 | 2,11 |
| 2 | 3 | 1,87 | 2 | 1,58 | 3 | 1,87 | 8 | 5,32 | 2,67 | 1,77 |
| 3 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 4 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 5 | 3 | 1,87 | 4 | 2,12 | 3 | 1,87 | 10 | 5,86 | 3,33 | 1,95 |
| 6 | 2 | 1,58 | 4 | 2,12 | 3 | 1,87 | 9 | 5,57 | 3,00 | 1,86 |
| 7 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 8 | 4 | 2,12 | 3 | 1,87 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 9 | 4 | 2,12 | 4 | 2,12 | 5 | 2,35 | 13 | 6,59 | 4,33 | 2,20 |
| 10 | 5 | 2,35 | 4 | 2,12 | 5 | 2,35 | 14 | 6,81 | 4,67 | 2,27 |
| 11 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 12 | 3 | 1,87 | 4 | 2,12 | 2 | 1,58 | 9 | 5,57 | 3,00 | 1,86 |
| 13 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 14 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 15 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 16 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 17 | 3 | 1,87 | 2 | 1,58 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| 18 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 19 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 20 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 21 | 4 | 2,12 | 2 | 1,58 | 2 | 1,58 | 8 | 5,28 | 2,67 | 1,76 |
| 22 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 23 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 24 | 3 | 1,87 | 3 | 1,87 | 4 | 2,12 | 10 | 5,86 | 3,33 | 1,95 |
| 25 | 3 | 1,87 | 2 | 1,58 | 5 | 2,35 | 10 | 5,80 | 3,33 | 1,93 |
| 26 | 3 | 1,87 | 3 | 1,87 | 3 | 1,87 | 9 | 5,61 | 3,00 | 1,87 |
| 27 | 3 | 1,87 | 4 | 2,12 | 4 | 2,12 | 11 | 6,11 | 3,67 | 2,04 |
| 28 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 29 | 4 | 2,12 | 4 | 2,12 | 4 | 2,12 | 12 | 6,36 | 4,00 | 2,12 |
| 30 | 3 | 1,87 | 2 | 1,58 | 4 | 2,12 | 9 | 5,57 | 3,00 | 1,86 |
| Total | 96 | 57,56 | 95,00 | 57,18 | 109,00 | 60,70 | 300,00 | 175,44 | 100,00 | 58,48 |
| Rata-rata | 3,20 | 1,92 | 3,17 | 1,91 | 3,63 | 2,02 | 10,00 | 5,85 | 3,33 | 1,95 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data asli Makaroni Cassava Koro terhadap Aroma | | | | |
| Kelompok Ulangan | Suhu Pengukusan Makaroni | | | Total Kelompok |
| a1 | a2 | a3 |
| 1 | 3,23 | 3,23 | 3,27 | 9,73 |
| 2 | 3,13 | 3,17 | 3,30 | 9,60 |
| 3 | 3,23 | 3,17 | 3,27 | 9,67 |
| 4 | 3,23 | 3,30 | 3,30 | 9,83 |
| 5 | 3,23 | 3,30 | 3,30 | 9,83 |
| 6 | 3,20 | 3,20 | 3,37 | 9,77 |
| 7 | 3,10 | 3,30 | 3,37 | 9,77 |
| 8 | 3,13 | 3,17 | 3,33 | 9,63 |
| 9 | 3,20 | 3,17 | 3,63 | 10,00 |
| Total perlakuan | 28,70 | 29,00 | 30,13 | 87,83 |
| Rata-rata | 3,19 | 3,22 | 3,35 | 9,76 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data Transformasi Makaroni Cassava Koro Terhadap Aroma | | | | |
| Kelompok Ulangan | Suhu Pengukusan Makaroni | | | Total Kelompok |
| a1 | a2 | a3 |
| 1 | 1,93 | 1,92 | 1,93 | 5,77 |
| 2 | 1,90 | 1,91 | 1,94 | 5,74 |
| 3 | 1,93 | 1,91 | 1,93 | 5,76 |
| 4 | 1,93 | 1,94 | 1,94 | 5,81 |
| 5 | 1,96 | 1,96 | 1,95 | 5,87 |
| 6 | 1,91 | 1,92 | 1,95 | 5,79 |
| 7 | 1,89 | 1,94 | 1,96 | 5,79 |
| 8 | 1,90 | 1,91 | 1,95 | 5,75 |
| 9 | 1,92 | 1,91 | 2,02 | 5,85 |
| Total perlakuan | 17,25 | 17,31 | 17,57 | 52,13 |
| Rata-rata | 1,92 | 1,92 | 1,95 | 10,43 |

Perhitungan ANAVA

Faktor Koreksi (FK) =

=

= 100,64

JK Total (JKT) = - FK

= – 100,64

= 0,0197

JK Kelompok (JKK) = - FK

= – 100,64

= 0,0048

JK Perlakuan (JKP) = - FK

= – 100,64

= 0,0064

JK Galat (JKG) = JKT – JKK- JKP

= 0,0197 – 0,0048 – 0,0064

= 0,0084

Tabel ANAVA Uji Organoleptik Terhadap Aroma

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variansi | Db | JK | KT | F Hitung | F Tabel |
| Kelompok | 8 | 0,0048 | 0,0006 | - | - |
| Perlakuan | 2 | 0,0064 | 0,0032 | 6,104\* | 3,63 |
| Galat | 16 | 0,0084 | 0,0005 |  |  |
| Total | 26 | 0,0197 |  |  |  |

\*) Berpengaruh Nyata

Kesimpulan :

Berdasarkan Tabel ANAVA diatas, F Hitung lebih besar dibandingkan F tabel pada taraf 5 % maka dapat disimpulkan bahwa perlakuan suhu pengukusan makaroni berpengaruh terhadap aroma makaroni sehingga perlu dilakukan uji lanjut, uji lanjut yang digunakan adalah uji lanjut Duncan.

**Perhitungan Uji Lanjut Duncan**

Sy = = = 0,0076

Uji Lanjut Duncan Terhadap Aroma Makaroni Cassava Koro

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Kode sampel | Rata-rata perlakuan | Perlakuan | | | | | Taraf Nyata |
| 1 | | 2 | | 3 |
|  |  | a1 | 1,92 | - |  | - |  | - | a |
| 3,00 | 0,0229 | a2 | 1,92 | 0,01 | tn | - |  | - | a |
| 3,15 | 0,0241 | a3 | 1,95 | 0,04 | \* | 0,03 | \* | - | b |

Keterangan : \*) Berbeda nyata tn) tidak berbeda nyata

Data Hasil Uji Lanjut Duncan Terhadap Aroma Makaroni Cassava Koro

|  |  |  |
| --- | --- | --- |
| Suhu Pengukusan Makaroni | Nilai Asli Rata- Rata Warna | Taraf Nyata 5% |
| a1 (60oC) | 3,19 | a |
| a2 (80oC) | 3,22 | a |
| a3 (100oC) | 3,35 | b |

Kesimpulan :

Berdasarkan tabel hasil uji lanjut Duncan dapat disimpulkan bahwa terjadi peningkatan kesukaan terhadap aroma makaroni yang nyata pada perlakuan a3 terhadap a1 dan a2 tetapi tidak terjadi pada perlakuan a1 terhadap a2.

**Penentuan Perlakuan Terbaik dari Produk Makaroni Cassava Koro pada Penelitiian Pendahuluan**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Perlakuan Suhu Pengukusan** | **Uji Organoleptik Makaroni Cassava Koro** | | | | | | | | **Jumlah** |
| **Warna** | | **Rasa** | | **Tekstur** | | **Aroma** | |
| a1 | 3,22 | a | 3,36 | a | 2,94 | a | 3,19 | a | 3,18 |
| a2 | 3,49 | b | 3,37 | b | 3,15 | b | 3,22 | a | 3,31 |
| **a3** | **4,10** | **b** | **3,45** | **c** | **3,69** | **c** | **3,35** | **b** | **3,65** |

Kesimpulan :

Berdasarkan hasil penelitian pendahuluan yang dilakukan dengan uji hedonik terhadap produk Makaroni Cassava Koro dapat disimpulkan bahwa perlakuan terbaik adalah perlakuan a1 atau pengukusan suhu 100oC sehingga suhu pengukusan ini yang akan digunakan pada penelitian utama.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Waktu Pengukusan** | **Perbandingan Jumlah Tepung Komposit** | **Kelompok Ulangan** | | | | **Total** | | **Rata-Rata** | |
| **1** | | **2** | |
| **(A)** | **(B)** | **DA** | **DT** | **DA** | **DT** | **DA** | **DT** | **DA** | **DT** |
| **a1 t = 5 menit** | **b1 (10:0:0)** | 2,77 | 1,79 | 2,93 | 1,83 | 5,70 | 3,62 | 1,81 | 1,81 |
| **b2 (8:1:1)** | 3,07 | 1,88 | 3,17 | 1,90 | 6,23 | 3,78 | 1,89 | 1,89 |
| **b3 (6:2:2)** | 3,80 | 2,06 | 3,70 | 2,04 | 7,50 | 4,10 | 2,05 | 2,05 |
| **b4 (4:3:3)** | 4,47 | 2,23 | 4,53 | 2,24 | 9,00 | 4,47 | 2,23 | 2,23 |
| **b5 (2:4:4)** | 4,40 | 2,20 | 4,83 | 2,31 | 9,23 | 4,51 | 2,26 | 2,26 |
| **Sub Total** | | 18,50 | 10,16 | 19,17 | 10,31 | 37,67 | 20,47 | 10,23 | 10,23 |
| **Rata-Rata** | | 3,70 | 2,03 | 3,83 | 2,06 | 7,53 | 4,09 | 2,05 | 2,05 |
| **a2 t = 10 menit** | **b1 (10:0:0)** | 2,53 | 1,72 | 2,67 | 1,76 | 5,20 | 3,49 | 1,74 | 1,74 |
| **b2 (8:1:1)** | 2,80 | 1,80 | 2,83 | 1,81 | 5,63 | 3,62 | 1,81 | 1,81 |
| **b3 (6:2:2)** | 3,87 | 2,08 | 4,37 | 2,20 | 8,23 | 4,28 | 2,14 | 2,14 |
| **b4 (4:3:3)** | 3,90 | 2,10 | 3,90 | 2,09 | 7,80 | 4,19 | 2,09 | 2,09 |
| **b5 (2:4:4)** | 4,33 | 2,18 | 4,70 | 2,28 | 9,03 | 4,46 | 2,23 | 2,23 |
| **Sub Total** | | 17,43 | 9,89 | 18,47 | 10,14 | 35,90 | 20,03 | 10,01 | 10,01 |
| **Rata-Rata** | | 3,49 | 1,98 | 3,69 | 2,03 | 7,18 | 4,01 | 2,00 | 2,00 |
| **a3 t = 15 menit** | **b1 (10:0:0)** | 2,47 | 1,71 | 2,37 | 1,68 | 4,83 | 3,38 | 1,69 | 1,69 |
| **b2 (8:1:1)** | 2,40 | 1,69 | 2,27 | 1,65 | 4,67 | 3,34 | 1,67 | 1,67 |
| **b3 (6:2:2)** | 4,10 | 2,13 | 4,33 | 2,19 | 8,43 | 4,32 | 2,16 | 2,16 |
| **b4 (4:3:3)** | 3,40 | 1,97 | 3,27 | 1,93 | 6,67 | 3,90 | 1,95 | 1,95 |
| **b5 (2:4:4)** | 4,30 | 2,19 | 3,80 | 2,06 | 8,10 | 4,25 | 2,12 | 2,12 |
| **Sub Total** | | 16,67 | 9,68 | 16,03 | 9,51 | 32,70 | 19,19 | 9,60 | 9,60 |
| **Rata-rata** | | 3,33 | 1,94 | 3,21 | 1,90 | 6,54 | 3,84 | 1,92 | 1,92 |
| **Total** | | 52,60 | 29,72 | 53,67 | 29,97 | 106,27 | 59,69 | 29,85 | 29,85 |
| **Rata-rata**  Keterangan :  DA : Data Asli  DT : Data Transformasi | | 19,93 | 11,24 | 20,40 | 11,35 | 40,33 | 22,60 | 11,30 | 11,30 |

**Data Hasil Uji Organoleptik Pengaruh Waktu Pengukusan Dan Perbandingan Jumlah Tepung Komposit Terhadap Warna**

**Perhitungan Anava**

Faktor Koreksi (FK) = (Total)2

r x b x a

= (59,69)2

2 x 5 x 3

= 118,77

JK Kelompok (JKK) = – FK

= – 118,77

= 0,0020

JK Total (JKT) = [(a1b1)2 +... + (a3b3)2] - FK

= [(1,97)2 + ... + (21,95)2] – 118,77

= 1,2359

JK(a) = - FK

= – 118,77

= 0,0842

JK(b) = – FK

= – 118,77

= 1,0287

JK(ab) = – FK – JKa - JKb

= – 118,77 – 0,0842– 1,0287

= 0,0923

JKG = JKT – JKK- JK(a) – JK(b) – JK (ab)

= 1,2359 – 0,0020 – 0,0842 - 1,0287 – 0,0288

= 0,0288

**Hasil Analisis Variasi (ANAVA )**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variansi** | **db** | **JK** | **KT** | **F Hitung** | | **F Tabel** |
| **Kelompok** | 1 | 0,0020 | 0,0020 | - | | - |
| **A** | 2 | 0,0842 | 0,0421 | 20,44 | **\*** | 2,73 |
| **B** | 4 | 1,0287 | 0,2572 | 124,91 | **\*** | 3,11 |
| **AB** | 8 | 0,0923 | 0,0115 | 5,60 | **\*** | 2,70 |
| **Galat** | 14 | 0,0288 | 0,0021 |  |  |  |
| **Total** | 29 | 1,2359 |  |  |  |  |

Keterangan : \* = berpegaruh nyata

Kesimpulan :

Berdasarkan tabel ANAVA diketahui bahwa F hitung ≥ F tabel pada taraf 5% dapat disimpulkan bahwa faktor A (Waktu Pengukusan), faktor B (Perbandingan jumlah tepung komposit) serta interaksi AB (waktu pengukusan dan perbandingan jumlah tepung komposit) berpengaruh nyata terhadap warna makaroni, sehingga perlu dilakukan uji lanjut, uji yang digunakkan adalah uji lanjut Duncan.

**Uji Lanjut Duncan Pada Taraf A**

Sy A =

=

= 0,004

Tabel Uji lanjut Duncan Faktor B (Waktu Pengukusan)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Kode | Rata-Rata | Perlakuan | |  |  |  |  | Notasi |
| 1 | | 2 | | 3 | |
| - | - | a3 | 1,92 | - | |  |  |  |  | A |
| 3,03 | 0,0137 | a2 | 2,00 | 0,080 | \* | - |  |  |  | b |
| 3,18 | 0,0144 | a1 | 2,05 | 0,130 | \* | 0,050 | \* | - |  | c |

Keterangan : \* = Berpengaruh nyata

Tabel Uji Lanjut Duncan Faktor A (waktu pengukusan) terhadap Warna

|  |  |  |  |
| --- | --- | --- | --- |
| Sampel | Waktu Pengukusan (menit) | Nilai Asli Rata- Rata | Taraf Nyata 5% |
| a1 | 5 | 3,77 | c |
| a2 | 10 | 3,59 | b |
| a3 | 15 | 3,27 | a |

Kesimpulan :

Berdasarkan tabel hasil uji lanjut Duncan dapat disimpulkan bahwa semakin lama waktu pengukusan terjadi peningkatan terhadap warna makaroni yang nyata pada perlakuan a1 terhadap a2 tetapi terjadi penurunan warna yang nyata pada perlakuan a3.

**Uji Lanjut Duncan Pada Taraf B**

Sy B =

=

= 0,006

Tabel Uji lanjut Duncan Faktor B (Perbandingan Jumlah Tepung Komposit)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Kode | Rata-Rata | Perlakuan | | | | | | | | | Notasi |
| 1 | | 2 | | 3 | | 4 |  | 5 |
| - | - | b1 | 1,748 | - | |  |  |  |  |  |  |  | a |
| 3,03 | 0,0229 | b2 | 1,788 | 0,041 | \* | - |  |  |  |  |  |  | b |
| 3,18 | 0,0240 | b4 | 2,092 | 0,344 | \* | 0,304 | \* | - |  |  |  |  | c |
| 3,27 | 0,0247 | b3 | 2,117 | 0,370 | \* | 0,329 | \* | 0,025 | \* |  |  |  | d |
| 3,33 | 0,0252 | b5 | 2,203 | 0,455 | \* | 0,415 | \* | 0,111 | \* | 0,086 | \* |  | e |

Keterangan : \* = berpengaruh nyata

Tabel Uji Lanjut Duncan Faktor B (Perbandingan jumlah tepung komposit) terhadap warna.

|  |  |  |  |
| --- | --- | --- | --- |
| Sampel | Perbandingan Jumlah Tepung Komposit | Nilai Asli Rata- Rata | Taraf Nyata 5% |
|
| b1 | (10 : 0 : 0) | 2,62 | A |
| b2 | (8 : 1 : 1) | 2,76 | B |
| b3 | (6 : 2 : 2) | 4,03 | D |
| b4 | (4 : 3 : 3) | 3,91 | C |
| b5 | (2 : 4 : 4) | 4,39 | E |

Kesimpulan :

Berdasarkan tabel hasil uji lanjut Duncan dapat disimpulkan bahwa semakin tinggi perbandingan tepung singkong dan tepung kacang koro terjadi peningkatan terhadap warna makaroni yang nyata pada perlakuan b1 terhadap b2, b3, b4 dan b5.

**Uji Lanjut Duncan Faktor AB**

Sy =

=

= 0,032

Tabel Uji Lanjut Duncan Faktor AB (Interaksi waktu pengukusan terhadap perbandingan jumlah tepung komposit) terhadap warna

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Kode | Rata-Rata | Perlakuan | | | | | | | | | | | | | | | Notasi |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| - | - | a3b2 | 1,670 | - |  |  |  |  |  |  |  |  |  |  |  |  |  |  | a |
| 3,03 | 0,097 | a3b1 | 1,691 | 0,021tn | - |  |  |  |  |  |  |  |  |  |  |  |  |  | a |
| 3,18 | 0,102 | a2b1 | 1,744 | 0,074tn | 0,052tn | - |  |  |  |  |  |  |  |  |  |  |  |  | a |
| 3,27 | 0,105 | a2b2 | 1,808 | 0,138\* | 0,116\* | 0,064tn | - |  |  |  |  |  |  |  |  |  |  |  | b |
| 3,33 | 0,107 | a1b1 | 1,808 | 0,138\* | 0,116\* | 0,064tn | 0,001tn | - |  |  |  |  |  |  |  |  |  |  | b |
| 3,37 | 0,108 | a1b2 | 1,888 | 0,218\* | 0,196\* | 0,144\* | 0,079tn | 0,079tn | - |  |  |  |  |  |  |  |  |  | cd |
| 3,39 | 0,109 | a3b4 | 1,950 | 0,280\* | 0,258\* | 0,206\* | 0,142\* | 0,142\* | 0,062tn | - |  |  |  |  |  |  |  |  | c |
| 3,41 | 0,109 | a1b3 | 2,050 | 0,380\* | 0,358\* | 0,306\* | 0,241\* | 0,241\* | 0,162\* | 0,099tn | - |  |  |  |  |  |  |  | d |
| 3,42 | 0,110 | a2b4 | 2,093 | 0,422\* | 0,401\* | 0,348\* | 0,284\* | 0,284\* | 0,204\* | 0,142\* | 0,042tn | - |  |  |  |  |  |  | e |
| 3,44 | 0,110 | a3b5 | 2,123 | 0,453\* | 0,432\* | 0,379\* | 0,315\* | 0,315\* | 0,235\* | 0,173\* | 0,073tn | 0,030tn | - |  |  |  |  |  | e |
| 3,445 | 0,111 | a2b3 | 2,141 | 0,471\* | 0,449\* | 0,396\* | 0,332\* | 0,332\* | 0,252\* | 0,190\* | 0,090tn | 0,048tn | 0,017tn | - |  |  |  |  | ef |
| 3,45 | 0,111 | a3b3 | 2,162 | 0,492\* | 0,470\* | 0,418\* | 0,353\* | 0,353\* | 0,274\* | 0,211\* | 0,112tn | 0,069tn | 0,038tn | 0,021tn | - |  |  |  | ef |
| 3,455 | 0,111 | a2b5 | 2,230 | 0,560\* | 0,538\* | 0,486\* | 0,421\* | 0,421\* | 0,342\* | 0,279\* | 0,179\* | 0,137\* | 0,106tn | 0,089tn | 0,067tn | - |  |  | fg |
| 3,46 | 0,111 | a1b4 | 2,233 | 0,563\* | 0,542\* | 0,489\* | 0,425\* | 0,425\* | 0,345\* | 0,283\* | 0,183\* | 0,140\* | 0,109tn | 0,092tn | 0,071tn | 0,003tn | - |  | fg |
| 3,46 | 0,111 | a1b5 | 2,256 | 0,586\* | 0,564\* | 0,512\* | 0,448\* | 0,447\* | 0,368\* | 0,305\* | 0,206\* | 0,163\* | 0,132\* | 0,115\* | 0,094tn | 0,026tn | 0,022tn | - | g |

Tabel dua arah (Two Way) untuk A sama B yang berbeda

Interaksi taraf a1 terhaadap b

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 | | 4 | | 5 |
| - | - | a1b1 | 1,81 | - |  | - |  | - |  |  |  |  | a |
| 3,03 | 0,0972 | a1b2 | 1,89 | 0,080 | tn | - |  | - |  |  |  |  | a |
| 3,18 | 0,1020 | a1b3 | 2,05 | 0,240 | \* | 0,160 | \* | - |  |  |  |  | b |
| 3,27 | 0,1049 | a1b4 | 2,23 | 0,420 | \* | 0,340 | \* | 0,180 | \* | - |  |  | c |
| 3,30 | 0,1059 | a1b5 | 2,26 | 0,450 | \* | 0,370 | \* | 0,210 | \* | 0,030 | tn | - | c |

Interaksi taraf a2 terhaadap b

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 | | 4 | | 5 |
| - | - | a2b1 | 1,74 | - |  | - |  | - |  |  |  |  | a |
| 3,03 | 0,0972 | a2b2 | 1,81 | 0,070 | tn | - |  | - |  |  |  |  | a |
| 3,18 | 0,1020 | a2b4 | 2,09 | 0,350 | \* | 0,280 | \* | - |  |  |  |  | b |
| 3,27 | 0,1049 | a2b3 | 2,14 | 0,400 | \* | 0,330 | \* | 0,050 | tn | - |  |  | b |
| 3,30 | 0,1059 | a2b5 | 2,23 | 0,490 | \* | 0,420 | \* | 0,140 | tn | 0,090 | tn | - | b |

Interaksi taraf a3 terhaadap b

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 | | 4 | | 5 |
| - | - | a3b2 | 1,67 | - |  | - |  | - |  |  |  |  | a |
| 3,03 | 0,0972 | a3b1 | 1,69 | 0,020 | tn | - |  | - |  |  |  |  | a |
| 3,18 | 0,1020 | a3b4 | 1,95 | 0,280 | \* | 0,260 | \* | - |  |  |  |  | b |
| 3,27 | 0,1049 | a3b5 | 2,12 | 0,450 | \* | 0,430 | \* | 0,170 | \* | - |  |  | c |
| 3,30 | 0,1059 | a3b3 | 2,16 | 0,490 | \* | 0,470 | \* | 0,210 | \* | 0,040 | tn | - | c |

Tabel dua arah (Two Way) untuk B sama A yang berbeda

Interaksi taraf b1 terhaadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a3b1 | 1,69 | - |  | - |  | - | A |
| 3,03 | 0,0972 | a2b1 | 1,74 | 0,050 | tn | - |  | - | A |
| 3,18 | 0,1020 | a1b1 | 1,81 | 0,120 | \* | 0,070 | \* | - | B |

Interaksi taraf b2 terhaadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a3b2 | 1,67 | - |  | - |  | - | A |
| 3,03 | 0,0972 | a2b2 | 1,81 | 0,140 | \* | - |  | - | B |
| 3,18 | 0,1020 | a1b2 | 1,89 | 0,220 | \* | 0,080 | tn | - | B |

Interaksi taraf b3 terhaadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a1b3 | 2,05 | - |  | - |  | - | A |
| 3,03 | 0,0972 | a2b3 | 2,14 | 0,090 | tn | - |  | - | A |
| 3,18 | 0,1020 | a3b3 | 2,16 | 0,110 | \* | 0,020 | tn | - | B |

Interaksi taraf b4 terhaadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a3b4 | 1,95 | - |  | - |  | - | A |
| 3,03 | 0,0972 | a2b4 | 2,09 | 0,140 | \* | - |  | - | B |
| 3,18 | 0,1020 | a1b4 | 2,23 | 0,140 | \* | 0,140 | \* | - | C |

Interaksi taraf b5 terhaadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a3b5 | 2,12 | - |  | - |  | - | A |
| 3,03  **Data Hasil Analisis Pengaruh Waktu Pengukusan Dan Perbandingan Jumlah Tepung Komposit** | 0,0972 | a2b5 | 2,23 | 0,110 | \* | - |  | - | B |
| 3,18 | 0,1020 | a1b5 | 2,26 | 0,140 | \* | 0,030 | tn | - | B |

Tabel Dwi Arah Pengaruh Interaksi Waktu Pengukusan dan Perbandingaan Jumlah Tepung Komposit Terhadap Warna Makaroni

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Waktu Pengukusan | Jumlah Perbandingan Tepung Komposit | | | | |
| b1 (10;0;0) | b2(8;1;1) | b3(6;2;2) | b4(4;3;3) | b5(2;4;4) |
| a1 (t= 5) | B | B | A | C | **B** |
| 1,81 | 1,89 | 2,05 | 2,23 | **2,26** |
| a | a | B | c | **c** |
| a2 (t= 10) | A | B | A | B | B |
| 1,74 | 1,81 | 2,14 | 2,09 | 2,23 |
| a | a | B | b | b |
| a3(t = 15) | A | A | B | A | A |
| 1,69 | 1,67 | 2,16 | 1,95 | 2,12 |
| a | a | C | b | c |

Keterangan :

* Huruf kecil dibaca secara horizontal, huruf kapital dibaca vertikal.
* Setiap huruf yang berbeda menunjukan perbedaan yang nyata berdasarkan Uji Lanjut Duncan pada taraf 5%.

**Data Hasil Analisis Organoleptik Pengaruh waktu pengukusan dan perbandingan jumlah Tepung Komposit Terhadap Bentuk**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Waktu Pengukusan** | **Perbandingan Jumlah Tepung Komposit** | **Kelompok Ulangan** | | | | **Total** | | **Rata-Rata** | |
| **A** | **B** | **1** | | **2** | |
| **DA** | **DT** | **DA** | **DT** | **DA** | **DT** | **DA** | **DT** |
| **a1 = 5 menit** | **b1 (10:0:0)** | 2,50 | 1,71 | 2,63 | 1,75 | 5,13 | 3,46 | 2,57 | 1,73 |
| **b2 (8:1:1)** | 2,70 | 1,77 | 2,70 | 1,77 | 5,40 | 3,55 | 2,70 | 1,77 |
| **b3 (6:2:2)** | 3,97 | 2,11 | 3,67 | 2,03 | 7,63 | 4,14 | 3,82 | 2,07 |
| **b4 (4:3:3)** | 4,60 | 2,25 | 4,60 | 2,26 | 9,20 | 4,51 | 4,60 | 2,26 |
| **b5 (2:4:4)** | 4,50 | 2,23 | 4,60 | 2,25 | 9,10 | 4,48 | 4,55 | 2,24 |
| **Sub Total** | | 18,27 | 10,08 | 18,20 | 10,07 | 36,47 | 20,14 | 18,23 | 10,07 |
| **Rata-Rata** | | 3,65 | 2,02 | 3,64 | 2,01 | 7,29 | 4,03 | 3,65 | 2,01 |
| **a2 = 10 menit** | **b1 (10:0:0)** | 2,70 | 1,77 | 2,80 | 1,80 | 5,50 | 3,56 | 2,75 | 1,78 |
| **b2 (8:1:1)** | 2,83 | 1,81 | 2,87 | 1,82 | 5,70 | 3,64 | 2,85 | 1,82 |
| **b3 (6:2:2)** | 3,87 | 2,09 | 4,10 | 2,14 | 7,97 | 4,23 | 3,98 | 2,11 |
| **b4 (4:3:3)** | 4,27 | 2,18 | 4,23 | 2,17 | 8,50 | 4,35 | 4,25 | 2,17 |
| **b5 (2:4:4)** | 4,20 | 2,14 | 4,57 | 2,25 | 8,77 | 4,38 | 4,38 | 2,19 |
| **Sub Total** | | 17,87 | 9,98 | 18,57 | 10,17 | 36,43 | 20,16 | 18,22 | 10,08 |
| **Rata-Rata** | | 3,57 | 2,00 | 3,71 | 2,03 | 7,29 | 4,03 | 3,64 | 2,02 |
| **a3 = 15 menit** | **b1 (10:0:0)** | 2,43 | 1,69 | 2,37 | 1,67 | 4,80 | 3,37 | 2,40 | 1,68 |
| **b2 (8:1:1)** | 2,37 | 1,67 | 2,47 | 1,70 | 4,83 | 3,37 | 2,42 | 1,69 |
| **b3 (6:2:2)** | 4,10 | 2,14 | 4,17 | 2,15 | 8,27 | 4,29 | 4,13 | 2,15 |
| **b4 (4:3:3)** | 3,33 | 1,95 | 3,27 | 1,93 | 6,60 | 3,87 | 3,30 | 1,94 |
| **b5 (2:4:4)** | 4,10 | 2,14 | 3,60 | 2,02 | 7,70 | 4,15 | 3,85 | 2,08 |
| **Sub Total** | | 16,33 | 9,59 | 15,87 | 9,47 | 32,20 | 19,06 | 16,10 | 9,53 |
| **Rata-rata** | | 3,27 | 1,92 | 3,17 | 1,89 | 6,44 | 3,81 | 3,22 | 1,91 |
| **Total** | | 52,47 | 29,65 | 52,63 | 29,71 | 105,10 | 59,36 | 52,55 | 29,68 |
| **Rata-rata** | | 19,90 | 11,22 | 20,00 | 11,25 | 39,89 | 22,47 | 19,95 | 11,24 |

**Perhitungan Anava**

Faktor Koreksi (FK) = (Total)2

r x b x a

= (59,36)2

2 x 5 x 3

= 117,47

JK Kelompok (JKK) = – FK

= – 117,47

= 0,0001

JK Total (JKT) = [(a1b1)2 +... + (a3b3)2] - FK

= [(1,71)2 + ... + (4,15)2] – 117,47

= 1,2884

JK(a) = - FK

= – 117,47

= 0,0789

JK(b) = – FK

= – 117,47

= 1,0979

JK(ab) = – FK – JKa - JKb

= – 117,47 – 0,0789– 1,0979

= 0,0920

JKG = JKT – JKK- JK(a) – JK(b) – JK (ab)

= 1,2884 – 0,0001 – 0,0789 - 1,0979 – 0,0920

= 0,0196

**Hasil Analisis Variasi (ANAVA )**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variansi** | **Db** | **JK** | **KT** | **F Hitung** | | **F Tabel** |
| Kelompok | 1 | 0,0001 | 0,0001 | - | | - |
| A | 2 | 0,0789 | 0,0394 | 28,211 | **\*** | 2,73 |
| B | 4 | 1,0979 | 0,2745 | 196,280 | **\*** | 3,11 |
| AB | 8 | 0,0920 | 0,0115 | 8,220 | **\*** | 2,70 |
| Galat | 14 | 0,0196 | 0,0014 |  |  |  |
| Total | 29 | 1,2884 |  |  |  |  |

Keterangan : \* = berpegaruh nyata

Kesimpulan :

Berdasarkan tabel ANAVA diketahui bahwa F hitung ≥ F tabel pada taraf 5% dapat disimpulkan bahwa faktor A (Waktu Pengukusan), faktor B (Perbandingan jumlah tepung komposit) serta interaksi AB (waktu pengukusan dan perbandingan jumlah tepung komposit) berpengaruh nyata terhadap bentuk makaroni, sehingga perlu dilakukan uji lanjut, uji yang digunakkan adalah uji lanjut Duncan.

**Uji Lanjut Duncan Pada Taraf A**

Sy A =

=

= 0,004

Tabel Uji Lanjut Duncan terhadap faktor A (Waktu Pengukusan)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Kode | Rata-Rata | Perlakuan | |  |  |  |  | Notasi |
| 1 | | 2 | | 3 | |
| - | - | a3 | 1,91 | - | |  |  |  |  | a |
| 3,03 | 0,0113 | a1 | 2,01 | 0,100 | \* | - |  |  |  | b |
| 3,18 | 0,0119 | a2 | 2,02 | 0,110 | \* | 0,010 | tn | - |  | b |

Keterangan : \* = berpengaruh nyata, tn = tidak berpengaruh nyata

Tabel Uji Lanjut Duncan Faktor A (Waktu Pengukusan) Terhadap Bentuk

|  |  |  |  |
| --- | --- | --- | --- |
| Sampel | Waktu Pengukusan | Nilai Asli Rata- Rata | Taraf Nyata 5% |
| a1 | 5 | 2,01 | B |
| a2 | 10 | 2,02 | B |
| a3 | 15 | 1,91 | A |

Kesimpulan :

Berdasarkan tabel hasil uji lanjut Duncan dapat disimpulkan bahwa semakin lama waktu pengukusan terjadi penurunan terhadap bentuk makaroni yang nyata pada perlakuan a3 terhadap a1 dan a2. Pada perlakuan a1 tidak terjadi peningkatan yang nyata terhadap a2.

**Uji Lanjut Duncan Pada Taraf B**

Sy B =

=

= 0,006

Tabel Uji lanjut duncan faktor B (Perbandingan Jumlah Tepung komposit)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Kode | Rata-Rata | Perlakuan | | | | | | | | | Notasi |
| 1 | | 2 | | 3 | | 4 |  | 5 |
| - | - | b1 | 1,730 | - | |  |  |  |  |  |  |  | a |
| 3,03 | 0,0189 | b2 | 1,760 | 0,030 | \* | - |  |  |  |  |  |  | b |
| 3,18 | 0,0198 | b3 | 2,110 | 0,380 | \* | 0,350 | \* | - |  |  |  |  | c |
| 3,27 | 0,0204 | b4 | 2,120 | 0,390 | \* | 0,360 | \* | 0,010 | tn |  |  |  | c |
| 3,33 | 0,0208 | b5 | 2,170 | 0,440 | \* | 0,410 | \* | 0,060 | \* | 0,050 | \* |  | d |

Keterangan : \* = berpengaruh nyata, tn = tidak berpengaruh nyata

Tabel Uji Lanjut Duncan Faktor B (perbandingan jumlah tepung komposit) terhadap Bentuk.

|  |  |  |  |
| --- | --- | --- | --- |
| Sampel | Perbandingan Jumlah Tepung Komposit | Nilai Asli Rata- Rata | Taraf Nyata 5% |
|
| b1 | (10 : 0 : 0) | 1,73 | a |
| b2 | (8 : 1 : 1) | 1,76 | b |
| b3 | (6 : 2 : 2) | 2,11 | c |
| b4 | (4 : 3 : 3) | 2,12 | c |
| b5 | (2 : 4 : 4) | 2,17 | d |

Kesimpulan :

Berdasarkan tabel hasil uji lanjut Duncan dapat disimpulkan bahwa semakin tinggi perbandingan tepung komposit dan tepung kacang koro terjadi peningkatan bentuk yang nyata untuk perbandingan b1, b2 b3, b4 dan b5, tetapi tidak berbeda nyata b3 terhadap b4.

**Uji Lanjut Duncan**

Sy =

=

= 0,026

Tabel Uji Lanjut Duncan Faktor AB (Interaksi Waktu pengukusan terhadap perbandingan jumlah tepung komposit) terhadap Bentuk

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Kode | Rata-Rata | Perlakuan | | | | | | | | | | | | | | | Notasi |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| - | - | a3b1 | 1,68 | - |  |  |  |  |  |  |  |  |  |  |  |  |  |  | a |
| 3,03 | 0,08 | a3b2 | 1,69 | 0,01tn | - |  |  |  |  |  |  |  |  |  |  |  |  |  | ab |
| 3,18 | 0,084 | a1b1 | 1,73 | 0,05tn | 0,04tn | - |  |  |  |  |  |  |  |  |  |  |  |  | abc |
| 3,27 | 0,086 | a1b2 | 1,77 | 0,09\* | 0,08tn | 0,04tn | - |  |  |  |  |  |  |  |  |  |  |  | bcd |
| 3,33 | 0,088 | a2b1 | 1,78 | 0,1\* | 0,09\* | 0,05tn | 0,01tn | - |  |  |  |  |  |  |  |  |  |  | cd |
| 3,37 | 0,089 | a2b2 | 1,82 | 0,14\* | 0,13\* | 0,09\* | 0,05tn | 0,04tn | - |  |  |  |  |  |  |  |  |  | d |
| 3,39 | 0,09 | a3b4 | 1,94 | 0,26\* | 0,25\* | 0,21\* | 0,17\* | 0,16\* | 0,12\* | - |  |  |  |  |  |  |  |  | e |
| 3,41 | 0,09 | a1b3 | 2,07 | 0,39\* | 0,38\* | 0,34\* | 0,30\* | 0,29\* | 0,25\* | 0,13\* | - |  |  |  |  |  |  |  | f |
| 3,42 | 0,09 | a3b5 | 2,08 | 0,40\* | 0,39\* | 0,35\* | 0,31\* | 0,30\* | 0,26\* | 0,14\* | 0,01tn | - |  |  |  |  |  |  | fg |
| 3,44 | 0,091 | a2b3 | 2,11 | 0,43\* | 0,42\* | 0,38\* | 0,34\* | 0,33\* | 0,29\* | 0,17\* | 0,04tn | 0,03tn | - |  |  |  |  |  | fgh |
| 3,445 | 0,091 | a3b3 | 2,15 | 0,47\* | 0,46\* | 0,42\* | 0,38\* | 0,37\* | 0,33\* | 0,21\* | 0,08tn | 0,07tn | 0,04tn | - |  |  |  |  | fgh |
| 3,45 | 0,091 | a2b4 | 2,17 | 0,49\* | 0,48\* | 0,44\* | 0,40\* | 0,39\* | 0,35\* | 0,23\* | 0,10\* | 0,09tn | 0,06tn | 0,02tn | - |  |  |  | gh |
| 3,455 | 0,091 | a2b5 | 2,19 | 0,51\* | 0,50\* | 0,46\* | 0,42\* | 0,41\* | 0,37\* | 0,25\* | 0,12\* | 0,11\* | 0,08tn | 0,04tn | 0,02tn | - |  |  | h |
| 3,46 | 0,091 | a1b5 | 2,24 | 0,56\* | 0,55\* | 0,51\* | 0,47\* | 0,46\* | 0,42\* | 0,30\* | 0,17\* | 0,16\* | 0,13\* | 0,09tn | 0,07tn | 0,05tn | - |  | hi |
| 3,46 | 0,091 | a1b4 | 2,26 | 0,58\* | 0,57\* | 0,53\* | 0,49\* | 0,48\* | 0,44\* | 0,32\* | 0,19\* | 0,18\* | 0,15\* | 0,11\* | 0,09tn | 0,07tn | 0,02tn | - | i |

Tabel dua arah (Two Way) untuk A sama B yang berbeda

Tabel Interaksi a1 terhadap b

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 | | 4 | | 5 |
| - | - | a1b1 | 1,73 | - |  | - |  | - |  |  |  |  | a |
| 3,03 | 0,0801 | a1b2 | 1,77 | 0,040 | tn | - |  | - |  |  |  |  | a |
| 3,18 | 0,0841 | a1b3 | 2,07 | 0,340 | \* | 0,300 | \* | - |  |  |  |  | b |
| 3,27 | 0,0865 | a1b5 | 2,24 | 0,510 | \* | 0,470 | \* | 0,170 | \* | - |  |  | c |
| 3,30 | 0,0873 | a1b4 | 2,26 | 0,530 | \* | 0,490 | \* | 0,190 | \* | 0,020 | tn | - | c |

Tabel Interaksi a2 terhadap b

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 | | 4 | | 5 |
| - | - | a2b1 | 1,78 | - |  | - |  | - |  |  |  |  | a |
| 3,03 | 0,0801 | a2b2 | 1,82 | 0,040 | tn | - |  | - |  |  |  |  | a |
| 3,18 | 0,0841 | a2b4 | 2,11 | 0,330 | \* | 0,290 | \* | - |  |  |  |  | b |
| 3,27 | 0,0865 | a2b3 | 2,17 | 0,390 | \* | 0,350 | \* | 0,060 | tn | - |  |  | b |
| 3,30 | 0,0873 | a2b5 | 2,19 | 0,410 | \* | 0,370 | \* | 0,080 | tn | 0,020 | tn | - | b |

Tabel Interaksi a3 terhadap b

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 | | 4 | | 5 |
| - | - | a3b1 | 1,68 | - |  | - |  | - |  |  |  |  | a |
| 3,03 | 0,0801 | a3b2 | 1,69 | 0,010 | tn | - |  | - |  |  |  |  | a |
| 3,18 | 0,0841 | a3b4 | 1,94 | 0,260 | \* | 0,250 | \* | - |  |  |  |  | b |
| 3,27 | 0,0865 | a3b5 | 2,08 | 0,400 | \* | 0,390 | \* | 0,140 | \* | - |  |  | c |
| 3,30 | 0,0873 | a3b3 | 2,15 | 0,470 | \* | 0,460 | \* | 0,210 | \* | 0,070 | tn | - | c |

Tabel dua arah (Two Way) untuk B sama A yang berbeda

Interaksi b1 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a3b1 | 1,68 | - |  | - |  | - | A |
| 3,03 | 0,0801 | a2b1 | 1,73 | 0,050 | tn | - |  | - | A |
| 3,18 | 0,0841 | a1b1 | 1,78 | 0,100 | \* | 0,050 | \* | - | B |

Interaksi b2 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a3b2 | 1,69 | - |  | - |  | - | A |
| 3,03 | 0,0801 | a1b2 | 1,77 | 0,080 | \* | - |  | - | B |
| 3,18 | 0,0841 | a2b2 | 1,82 | 0,130 | \* | 0,050 | tn | - | B |

Interaksi b3 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a1b3 | 2,07 | - |  | - |  | - | A |
| 3,03 | 0,0801 | a2b3 | 2,11 | 0,040 | tn | - |  | - | A |
| 3,18 | 0,0841 | a3b3 | 2,15 | 0,080 | \* | 0,040 | tn | - | B |

Interaksi b4 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a3b4 | 1,94 | - |  | - |  | - | A |
| 3,03 | 0,0801 | a2b4 | 2,17 | 0,230 | \* | - |  | - | B |
| 3,18 | 0,0841 | a1b4 | 2,26 | 0,320 | \* | 0,090 | \* | - | C |

Interaksi b5 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a3b5 | 2,08 | - |  | - |  | - | A |
| 3,03 | 0,0801 | a2b5 | 2,19 | 0,110 | \* | - |  | - | B |
| 3,18 | 0,0841 | a1b5 | 2,24 | 0,160 | \* | 0,050 | tn | - | B |

Tabel Dwi arah Uji organoleptik pengaruh interaksi waktu pengukusan terhadap jumlah perbandingan tepung komposit terhadap Bentuk

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Waktu Pengukusan | Jumlah Pperbandingan Tepung Komposit | | | | |
| b1 (10;0;0) | b2(8;1;1) | b3(6;2;2) | b4(4;3;3) | b5(2;4;4) |
| a1 (t= 5) | B | B | A | **C** | B |
| 2,57 | 2,70 | 3,82 | **4,60** | 4,55 |
| a | a | b | **c** | c |
| a2 (t= 10) | A | B | A | B | B |
| 2,75 | 2,85 | 3,98 | 4,25 | 4,38 |
| a | a | b | b | b |
| a3(t = 15) | A | A | B | A | A |
| 2,40 | 2,42 | 4,13 | 3,30 | 3,85 |
| a | a | c | b | c |

**Data Hasil Pengaruh waktu pengukusan dan perbandingan jumlah Tepung Komposit Terhadap Tekstur**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Waktu Pengukusan | Perbandingan Jumlah Tepung Komposit | Kelompok Ulangan | | | | Total | | Rata-Rata | |
| A | B | 1 | | 2 | |
| DA | DT | DA | DT | DA | DT | DA | DT |
| a1 = 5 menit | b1 (10:0:0) | 3,37 | 1,95 | 3,33 | 1,94 | 6,70 | 3,89 | 3,35 | 1,95 |
| b2 (8:1:1) | 3,17 | 1,90 | 3,30 | 1,94 | 6,47 | 3,83 | 3,23 | 1,92 |
| b3 (6:2:2) | 3,33 | 1,95 | 3,33 | 1,95 | 6,67 | 3,90 | 3,33 | 1,95 |
| b4 (4:3:3) | 3,63 | 2,02 | 3,80 | 2,06 | 7,43 | 4,08 | 3,72 | 2,04 |
| b5 (2:4:4) | 3,50 | 1,99 | 3,60 | 2,01 | 7,10 | 4,00 | 3,55 | 2,00 |
| Sub Total | | 17,00 | 9,81 | 17,37 | 9,90 | 34,37 | 19,70 | 17,18 | 9,85 |
| Rata-Rata | | 3,40 | 1,96 | 3,47 | 1,98 | 6,87 | 3,94 | 3,44 | 1,97 |
| a2 = 10 menit | b1 (10:0:0) | 3,43 | 1,97 | 3,23 | 1,92 | 6,67 | 3,89 | 3,33 | 1,95 |
| b2 (8:1:1) | 3,73 | 2,05 | 3,53 | 2,00 | 7,27 | 4,05 | 3,63 | 2,02 |
| b3 (6:2:2) | 3,87 | 2,08 | 3,93 | 2,10 | 7,80 | 4,17 | 3,90 | 2,09 |
| b4 (4:3:3) | 3,47 | 1,97 | 3,33 | 1,94 | 6,80 | 3,91 | 3,40 | 1,95 |
| b5 (2:4:4) | 3,43 | 1,96 | 3,57 | 2,00 | 7,00 | 3,96 | 3,50 | 1,98 |
| Sub Total | | 17,93 | 10,03 | 17,60 | 9,95 | 35,53 | 19,98 | 17,77 | 9,99 |
| Rata-Rata | | 3,59 | 2,01 | 3,52 | 1,99 | 7,11 | 4,00 | 3,55 | 2,00 |
| a3 = 15 menit | b1 (10:0:0) | 3,47 | 1,98 | 3,50 | 1,99 | 6,97 | 3,96 | 3,48 | 1,98 |
| b2 (8:1:1) | 3,40 | 1,97 | 3,43 | 1,97 | 6,83 | 3,94 | 3,42 | 1,97 |
| b3 (6:2:2) | 3,50 | 1,99 | 3,33 | 1,95 | 6,83 | 3,94 | 3,42 | 1,97 |
| b4 (4:3:3) | 3,90 | 2,09 | 4,07 | 2,13 | 7,97 | 4,22 | 3,98 | 2,11 |
| b5 (2:4:4) | 3,67 | 2,03 | 3,83 | 2,07 | 7,50 | 4,10 | 3,75 | 2,05 |
| Sub Total | | 17,93 | 10,05 | 18,17 | 10,10 | 36,10 | 20,15 | 18,05 | 10,08 |
| Rata-rata | | 3,59 | 2,01 | 3,63 | 2,02 | 7,22 | 4,03 | 3,61 | 2,02 |
| Total | | 52,87 | 29,88 | 53,13 | 29,95 | 106,00 | 59,83 | 53,00 | 29,92 |
| Rata-rata | | 19,95 | 11,28 | 20,04 | 11,31 | 39,99 | 22,59 | 20,00 | 11,30 |

**Perhitungan Anava**

Faktor Koreksi (FK) = (Total)2

r x b x a

= (59,83)2

2 x 5 x 3

= 119,34

JK Kelompok (JKK) = – FK

= – 119,34

= 0,0002

JK Total (JKT) = [(a1b1)2 +... + (a3b3)2] - FK

= [(1,95)2 + ... + (2,07)2] – 119,34

= 0,0957

JK(a) = - FK

= – 119,34

= 0,0101

JK(b) = – FK

= – 119,34

= 0,0231

JK(ab) = – FK – JKa - JKb

= – 119,34 – 0,0101– 0,0231

= 0,0527

JKG = JKT – JKK- JK(a) – JK(b) – JK (ab)

= 0,0957 – 0,0002 – 0,0101 - 0,0231 – 0,0527

= 0,0095

**Hasil Analisis Variasi (ANAVA )**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variansi | Db | JK | KT | F Hitung | | F Tabel |
| Kelompok | 1 | 0,0002 | 0,0002 | - | | - |
| A | 2 | 0,0101 | 0,0051 | 7,44 | **\*** | 2,73 |
| B | 4 | 0,0231 | 0,0058 | 8,48 | **\*** | 3,11 |
| AB | 8 | 0,0527 | 0,0066 | 9,67 | **\*** | 2,70 |
| Galat | 14 | 0,0095 | 0,0007 |  |  |  |
| Total | 29 | 0,0957 |  |  |  |  |

Keterangan : \* = berpegaruh nyata

Kesimpulan :

Berdasarkan tabel ANAVA diketahui bahwa F hitung ≥ F tabel pada taraf 5% dapat disimpulkan bahwa faktor A (Waktu Pengukusan), faktor B (Perbandingan jumlah tepung komposit) serta interaksi AB (waktu pengukusan dan perbandingan jumlah tepung komposit) berpengaruh nyata terhadap tekstur makaroni, sehingga perlu dilakukan uji lanjut, uji yang digunakan adalah uji lanjut Duncan.

**Uji Lanjut Duncan Faktor A**

Sy A =

=

**=** 0,003

Tabel Uji Lanjut Duncan faktor A (Waktu pengukusan)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Kode | Rata-Rata | Perlakuan | | | | | | Notasi |
| 1 | | 2 | | 3 | |
| - | - | a1 | 1,97 | - | |  |  |  |  | a |
| 3,03 | 0,0079 | a2 | 2,00 | 0,030 | \* | - |  |  |  | b |
| 3,18 | 0,0083 | a3 | 2,02 | 0,050 | \* | 0,020 | \* | - |  | c |

Keterangan : \*= berpengaruh nyata

Tabel Uji Lanjut Duncan Faktor A (Wakru Pengukusan) Terhadap Tekstur

|  |  |  |  |
| --- | --- | --- | --- |
| Sampel | Waktu Pengukusan | Nilai Asli Rata- Rata | Taraf Nyata 5% |
| a1 | 5 | 3,44 | a |
| a2 | 10 | 3,55 | b |
| a3 | 15 | 3,61 | c |

Kesimpulan :

Berdasarkan tabel hasil uji lanjut Duncan dapat disimpulkan bahwa semakin lama waktu pengukusan menyebabkan peningkatan terhadap tekstur makaroni yang nyata pada perlakuan a1 terhadap a2 dan a3.

**Uji Lanjut Duncan Faktor B**

Sy B =

=

**=** 0,004

Tabel Uji Lanjut Duncan faktor B (Perbandingan Jumlah Tepung Komposit)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Kode | Rata-Rata | Perlakuan | | | | | | | | | Notasi |
| 1 | | 2 | | 3 | | 4 |  | 5 |
| - | - | b1 | 1,960 | - | |  |  |  |  |  |  |  | A |
| 3,03 | 0,0132 | b2 | 1,970 | 0,010 | tn | - |  |  |  |  |  |  | A |
| 3,18 | 0,0138 | b3 | 2,000 | 0,040 | \* | 0,030 | \* | - |  |  |  |  | B |
| 3,27 | 0,0142 | b5 | 2,010 | 0,050 | \* | 0,040 | \* | 0,010 | tn |  |  |  | B |
| 3,33 | 0,0145 | b4 | 2,030 | 0,070 | \* | 0,060 | \* | 0,030 | \* | 0,020 | \* |  | C |

Keterangan : \*= berpengaruh nyata, tn = tidak berpengaruh nyata

Tabel Uji Lanjut Duncan faktor B (Perbandingan Jumlah Tepung Komposit)

|  |  |  |  |
| --- | --- | --- | --- |
| Sampel | Perbandingan Jumlah Tepung Komposit | Nilai Asli Rata- Rata | Taraf Nyata 5% |
|
| b1 | (10 : 0 : 0) | 3,39 | A |
| b2 | (8 : 1 : 1) | 3,43 | A |
| b3 | (6 : 2 : 2) | 3,55 | B |
| b4 | (4 : 3 : 3) | 3,70 | C |
| b5 | (2 : 4 : 4) | 3,60 | B |

Kesimpulan :

Berdasarkan tabel hasil uji lanjut Duncan dapat disimpulkan bahwa semakin tinggi perbandingan jumlah tepung singkong dan kacang koro terjadi peningkatan terhadap tekstur makaroni yang nyata pada perlakuan b1 terhadap b3, b5 dan b4, tetaapi tidak b1terhadap b2dan b3 terhadap b5.

**Uji Lanjut Duncan Faktor AB**

Sy =

=

**= 0,013**

Tabel Uji Lanjut Duncan Faktor AB (Interaksi waktu pengukusan terhadap perbandingan jumlah tepung komposit)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Kode | Rata-Rata | Perlakuan | | | | | | | | | | | | | | | Notasi |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| - | - | a1b2 | 1,92 | - |  |  |  |  |  |  |  |  |  |  |  |  |  |  | a |
| 3,03 | 0,04 | a1b1 | 1,95 | 0,03tn | - |  |  |  |  |  |  |  |  |  |  |  |  |  | ab |
| 3,18 | 0,042 | a1b3 | 1,95 | 0,03tn | 0,0 tn | - |  |  |  |  |  |  |  |  |  |  |  |  | ab |
| 3,27 | 0,043 | a2b1 | 1,95 | 0,03tn | 0,0 tn | 0,0 tn | - |  |  |  |  |  |  |  |  |  |  |  | ab |
| 3,33 | 0,043 | a2b4 | 1,95 | 0,03tn | 0,0 tn | 0,0 tn | 0,0 tn | - |  |  |  |  |  |  |  |  |  |  | ab |
| 3,37 | 0,044 | a3b2 | 1,97 | 0,05\* | 0,02tn | 0,02tn | 0,02tn | 0,02tn | - |  |  |  |  |  |  |  |  |  | bc |
| 3,39 | 0,044 | a3b3 | 1,97 | 0,05\* | 0,02tn | 0,02tn | 0,02tn | 0,02tn | 0,0 tn | - |  |  |  |  |  |  |  |  | bc |
| 3,41 | 0,045 | a2b5 | 1,98 | 0,06\* | 0,03tn | 0,03tn | 0,03tn | 0,03tn | 0,01tn | 0,01tn | - |  |  |  |  |  |  |  | bcd |
| 3,42 | 0,045 | a3b1 | 1,98 | 0,06\* | 0,03tn | 0,03tn | 0,03tn | 0,03tn | 0,01tn | 0,01tn | 0,0 tn | - |  |  |  |  |  |  | bcd |
| 3,44 | 0,045 | a1b5 | 2,00 | 0,08\* | 0,05\* | 0,05\* | 0,05\* | 0,05\* | 0,03tn | 0,03tn | 0,02tn | 0,02tn | - |  |  |  |  |  | cde |
| 3,445 | 0,045 | a2b2 | 2,02 | 0,10\* | 0,07\* | 0,07\* | 0,07\* | 0,07\* | 0,05\* | 0,05\* | 0,04tn | 0,04tn | 0,02tn | - |  |  |  |  | def |
| 3,45 | 0,045 | a1b4 | 2,04 | 0,12\* | 0,09\* | 0,09\* | 0,09\* | 0,09\* | 0,07\* | 0,07\* | 0,06\* | 0,06\* | 0,04tn | 0,02tn | - |  |  |  | ef |
| 3,455 | 0,045 | a3b5 | 2,05 | 0,13\* | 0,10\* | 0,1\* | 0,10\* | 0,10\* | 0,08\* | 0,08\* | 0,07\* | 0,07\* | 0,05\* | 0,03tn | 0,01tn | - |  |  | fg |
| 3,46 | 0,045 | a2b3 | 2,09 | 0,17\* | 0,14\* | 0,14\* | 0,14\* | 0,14\* | 0,12\* | 0,12\* | 0,11\* | 0,11\* | 0,09\* | 0,07\* | 0,05\* | 0,04tn | - |  | gh |
| 3,46 | 0,045 | a3b4 | 2,11 | 0,19\* | 0,16\* | 0,16\* | 0,16\* | 0,16\* | 0,14\* | 0,14\* | 0,13\* | 0,13\* | 0,11\* | 0,09\* | 0,07\* | 0,06\* | 0,02tn | - | h |

Tabel dua arah (Two Way) untuk A sama B yang berbeda

Interaksi a1 terhadap b

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 | | 4 | | 5 |
| - | - | a1b2 | 1,92 | - |  | - |  | - |  |  |  |  | a |
| 3,03 | 0,0396 | a1b1 | 1,95 | 0,030 | tn | - |  | - |  |  |  |  | a |
| 3,18 | 0,0415 | a1b3 | 1,95 | 0,030 | tn | 0,000 | tn | - |  |  |  |  | a |
| 3,27 | 0,0427 | a1b5 | 2,00 | 0,080 | \* | 0,050 | \* | 0,050 | \* | - |  |  | b |
| 3,30 | 0,0431 | a1b4 | 2,04 | 0,120 | \* | 0,090 | \* | 0,090 | \* | 0,040 | tn | - | b |

Interaksi a2 terhadap b

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 | | 4 | | 5 |
| - | - | a2b1 | 1,95 | - |  | - |  | - |  |  |  |  | a |
| 3,03 | 0,0396 | a2b4 | 1,95 | 0,000 | tn | - |  | - |  |  |  |  | a |
| 3,18 | 0,0415 | a2b5 | 1,98 | 0,030 | tn | 0,030 | tn | - |  |  |  |  | a |
| 3,27 | 0,0427 | a2b2 | 2,02 | 0,070 | \* | 0,070 | \* | 0,040 | tn | - |  |  | b |
| 3,30 | 0,0431 | a2b3 | 2,09 | 0,140 | \* | 0,140 | \* | 0,110 | \* | 0,070 | \* | - | c |

Interaksi a3 tehadap b

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 | | 4 | | 5 |
| - | - | a3b2 | 1,97 | - |  | - |  | - |  |  |  |  | a |
| 3,03 | 0,0396 | a3b3 | 1,97 | 0,000 | tn | - |  | - |  |  |  |  | a |
| 3,18 | 0,0415 | a3b1 | 1,98 | 0,010 | tn | 0,010 | tn | - |  |  |  |  | a |
| 3,27 | 0,0427 | a3b5 | 2,05 | 0,080 | \* | 0,080 | \* | 0,070 | \* | - |  |  | b |
| 3,30 | 0,0431 | a3b4 | 2,11 | 0,140 | \* | 0,140 | \* | 0,130 | \* | 0,060 | \* | - | c |

Tabel dua arah (Two Way) untuk B sama A yang berbeda

Interaksi b1 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a1b1 | 1,95 | - |  | - |  | - | A |
| 3,03 | 0,0396 | a2b1 | 1,95 | 0,000 | tn | - |  | - | A |
| 3,18 | 0,0415 | a3b1 | 1,98 | 0,030 | tn | 0,030 | tn | - | A |

Interaksi b2 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a1b2 | 1,92 | - |  | - |  | - | A |
| 3,03 | 0,0396 | a3b2 | 1,97 | 0,050 | \* | - |  | - | B |
| 3,18 | 0,0415 | a2b2 | 2,02 | 0,100 | \* | 0,050 | \* | - | C |

Interaksi b3 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a1b3 | 1,95 | - |  | - |  | - | A |
| 3,03 | 0,0396 | a3b3 | 1,97 | 0,020 | tn | - |  | - | A |
| 3,18 | 0,0415 | a2b3 | 2,09 | 0,140 | \* | 0,120 | \* | - | B |

Interaksi b4 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a2b4 | 1,95 | - |  | - |  | - | A |
| 3,03 | 0,0396 | a1b4 | 2,04 | 0,090 | \* | - |  | - | B |
| 3,18 | 0,0415 | a3b4 | 2,11 | 0,160 | \* | 0,070 | \* | - | C |

Interaksi b4 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a2b5 | 1,98 | - |  | - |  | - | A |
| 3,03 | 0,0396 | a1b5 | 2,00 | 0,020 | tn | - |  | - | A |
| 3,18 | 0,0415 | a3b5 | 2,05 | 0,070 | \* | 0,050 | \* | - | B |

Tabel Waktu Pengukusan dan Perbandingan Jumlah Tepung Komposit Terhadap Tekstur Makaroni

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Waktu Pengukusan | Jumlah Perbandingan Tepung Komposit | | | | |
| b1 (10;0;0) | b2(8;1;1) | b3(6;2;2) | b4(4;3;3) | b5(2;4;4) |
| a1 (t= 5) | A | A | A | B | A |
| 3,35 | 3,23 | 3,33 | 3,72 | 3,55 |
| a | a | a | b | b |
| a2 (t= 10) | A | C | B | A | A |
| 3,33 | 3,63 | 3,90 | 3,40 | 3,50 |
| a | b | c | a | a |
| a3(t = 15) | A | B | A | **C** | B |
| 3,48 | 3,42 | 3,42 | **3,98** | 3,75 |
| a | a | a | **b** | c |

**Data Hasil Analisis Organoleptik Pengaruh waktu pengukusan dan perbandingan jumlah Tepung Komposit Terhadap Aroma Makaroni**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Waktu Pengukusan** | **Perbandingan Jumlah Tepung Komposit** | **Kelompok Ulangan** | | | | **Total** | | **Rata-Rata** | |
| **1** | | **2** | |
| **A** | **B** | **DA** | **DT** | **DA** | **DT** | **DA** | **DT** | **DA** | **DT** |
| **a1 = 5 menit** | **b1 (10:0:0)** | 4,00 | 2,12 | 3,80 | 2,07 | 7,80 | 4,18 | 3,90 | 2,09 |
| **b2 (8:1:1)** | 3,60 | 2,02 | 3,57 | 2,01 | 7,17 | 4,03 | 3,58 | 2,01 |
| **b3 (6:2:2)** | 3,50 | 1,99 | 3,53 | 2,00 | 7,03 | 3,99 | 3,52 | 2,00 |
| **b4 (4:3:3)** | 3,63 | 2,02 | 3,90 | 2,09 | 7,53 | 4,12 | 3,77 | 2,06 |
| **b5 (2:4:4)** | 3,40 | 1,97 | 3,63 | 2,03 | 7,03 | 4,00 | 3,52 | 2,00 |
| **Sub Total** | | 18,13 | 10,12 | 18,43 | 10,20 | 36,57 | 20,32 | 18,28 | 10,16 |
| **Rata-Rata** | | 3,63 | 2,02 | 3,69 | 2,04 | 7,31 | 4,06 | 3,66 | 2,03 |
| **a2 = 10 menit** | **b1 (10:0:0)** | 3,73 | 2,05 | 3,77 | 2,06 | 7,50 | 4,11 | 3,75 | 2,06 |
| **b2 (8:1:1)** | 3,67 | 2,04 | 3,80 | 2,07 | 7,47 | 4,11 | 3,73 | 2,05 |
| **b3 (6:2:2)** | 3,50 | 1,99 | 3,70 | 2,04 | 7,20 | 4,04 | 3,60 | 2,02 |
| **b4 (4:3:3)** | 3,70 | 2,04 | 3,57 | 2,01 | 7,27 | 4,06 | 3,63 | 2,03 |
| **b5 (2:4:4)** | 3,10 | 1,89 | 3,63 | 2,02 | 6,73 | 3,91 | 3,37 | 1,96 |
| **Sub Total** | | 17,70 | 10,02 | 18,47 | 10,21 | 36,17 | 20,23 | 18,08 | 10,11 |
| **Rata-Rata** | | 3,54 | 2,00 | 3,69 | 2,04 | 7,23 | 4,05 | 3,62 | 2,02 |
| **a3 = 15 menit** | **b1 (10:0:0)** | 3,70 | 2,05 | 3,60 | 2,01 | 7,30 | 4,06 | 3,65 | 2,03 |
| **b2 (8:1:1)** | 3,53 | 2,00 | 3,57 | 2,01 | 7,10 | 4,00 | 3,55 | 2,00 |
| **b3 (6:2:2)** | 3,47 | 1,98 | 3,50 | 1,99 | 6,97 | 3,97 | 3,48 | 1,98 |
| **b4 (4:3:3)** | 3,77 | 2,06 | 3,50 | 1,99 | 7,27 | 4,05 | 3,63 | 2,03 |
| **b5 (2:4:4)** | 3,20 | 1,92 | 3,80 | 2,07 | 7,00 | 3,99 | 3,50 | 1,99 |
| **Sub Total** | | 17,67 | 10,00 | 17,97 | 10,07 | 35,63 | 20,08 | 17,82 | 10,04 |
| **Rata-rata** | | 3,53 | 2,00 | 3,59 | 2,01 | 7,13 | 4,02 | 3,56 | 2,01 |
| **Total** | | 53,50 | 30,14 | 54,87 | 30,49 | 108,37 | 60,63 | 54,18 | 30,31 |
| **Rata-rata** | | 20,22 | 11,39 | 20,75 | 11,52 | 40,97 | 22,91 | 20,49 | 11,46 |

**Perhitungan Anava**

Faktor Koreksi (FK) = (Total)2

r x b x a

= (61,41)2

2 x 5 x 3

= 125,70

JK Kelompok (JKK) = – FK

= – 125,70

= 0,0008

JK Total (JKT) = [(a1b1)2 +... + (a3b3)2] - FK

= [(2,12)2 + ... + (2,09)2] – 125,70

= 0,0552

JK(a) = - FK

= – 125,70

= 0,0015

JK(b) = – FK

= – 125,70

= 0,0077

JK(ab) = – FK – JKa - JKb

= – 125,70 – 0,0015– 0,0077

= 0,0170

JKG = JKT – JKK- JK(a) – JK(b) – JK (ab)

= 0,0552 – 0,0008 – 0,0015 - 0,0077 – 0,0170

= 0,0281

**Hasil Analisis Variasi (ANAVA )**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variansi** | **db** | **JK** | **KT** | **F Hitung** | | **F Tabel** |
| Kelompok | 1 | 0,0008 | 0,0008 | - | | - |
| A | 2 | 0,0015 | 0,0008 | 0,38 | **tn** | 2,73 |
| B | 4 | 0,0077 | 0,0019 | 0,96 | **tn** | 3,11 |
| AB | 8 | 0,0170 | 0,0021 | 1,06 | **tn** | 2,70 |
| Galat | 14 | 0,0281 | 0,0020 |  |  |  |
| Total | 29 | 0,0552 |  |  |  |  |

Keterangan : tn = tidak berpegaruh nyata

Kesimpulan :

Berdasarkan tabel ANAVA diketahui bahwa F hitung ≥ F tabel pada taraf 5% dapat disimpulkan bahwa faktor A (Waktu Pengukusan), faktor B (Perbandingan jumlah tepung komposit) serta interaksi AB (waktu pengukusan dan perbandingan jumlah tepung komposit) tidak berpengaruh nyata terhadap aroma makaroni, sehingga tidak perlu dilakukan uji lanjut.

**Data Hasil Analisis Organoleptik Pengaruh waktu pengukusan dan perbandingan jumlah Tepung Komposit Terhadap Rasa**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Waktu Pengukusan** | **Perbandingan Jumlah Tepung Komposit** | **Kelompok Ulangan** | | | | **Total** | | **Rata-Rata** | |
| **1** | | **2** | |
| **A** | **B** | **DA** | **DT** | **DA** | **DT** | **DA** | **DT** | **DA** | **DT** |
| **a1 = 5 menit** | **b1 (10:0:0)** | 3,90 | 2,09 | 3,90 | 2,09 | 7,80 | 4,18 | 3,90 | 2,09 |
| **b2 (8:1:1)** | 4,03 | 2,12 | 3,97 | 2,11 | 8,00 | 4,23 | 4,00 | 2,11 |
| **b3 (6:2:2)** | 3,63 | 2,03 | 3,33 | 1,95 | 6,97 | 3,97 | 3,48 | 1,99 |
| **b4 (4:3:3)** | 3,47 | 1,98 | 3,63 | 2,02 | 7,10 | 4,01 | 3,55 | 2,00 |
| **b5 (2:4:4)** | 3,17 | 1,91 | 3,30 | 1,94 | 6,47 | 3,85 | 3,23 | 1,92 |
| **Sub Total** | | 18,20 | 10,13 | 18,13 | 10,11 | 36,33 | 20,24 | 18,17 | 10,12 |
| **Rata-Rata** | | 3,64 | 2,03 | 3,63 | 2,02 | 7,27 | 4,05 | 3,63 | 2,02 |
| **a2 = 10 menit** | **b1 (10:0:0)** | 3,73 | 2,05 | 3,80 | 2,07 | 7,53 | 4,11 | 3,77 | 2,06 |
| **b2 (8:1:1)** | 3,73 | 2,05 | 3,77 | 2,06 | 7,50 | 4,11 | 3,75 | 2,06 |
| **b3 (6:2:2)** | 3,40 | 1,96 | 3,60 | 2,02 | 7,00 | 3,98 | 3,50 | 1,99 |
| **b4 (4:3:3)** | 3,30 | 1,94 | 3,17 | 1,91 | 6,47 | 3,84 | 3,23 | 1,92 |
| **b5 (2:4:4)** | 2,73 | 1,78 | 2,93 | 1,84 | 5,67 | 3,62 | 2,83 | 1,81 |
| **Sub Total** | | 16,90 | 9,78 | 17,27 | 9,89 | 34,17 | 19,67 | 17,08 | 9,83 |
| **Rata-Rata** | | 3,38 | 1,96 | 3,45 | 1,98 | 6,83 | 3,93 | 3,42 | 1,97 |
| **a3 = 15 menit** | **b1 (10:0:0)** | 3,80 | 2,07 | 3,70 | 2,04 | 7,50 | 4,10 | 3,75 | 2,05 |
| **b2 (8:1:1)** | 3,27 | 1,94 | 3,40 | 1,97 | 6,67 | 3,91 | 3,33 | 1,95 |
| **b3 (6:2:2)** | 3,17 | 1,91 | 3,20 | 1,92 | 6,37 | 3,82 | 3,18 | 1,91 |
| **b4 (4:3:3)** | 3,60 | 2,01 | 3,50 | 1,99 | 7,10 | 4,00 | 3,55 | 2,00 |
| **b5 (2:4:4)** | 3,10 | 1,88 | 3,30 | 1,94 | 6,40 | 3,82 | 3,20 | 1,91 |
| **Sub Total** | | 16,93 | 9,80 | 17,10 | 9,85 | 34,03 | 19,65 | 17,02 | 9,83 |
| **Rata-rata** | | 3,39 | 1,96 | 3,42 | 1,97 | 6,81 | 3,93 | 3,40 | 1,97 |
| **Total** | | 52,03 | 29,71 | 52,50 | 29,84 | 104,53 | 59,56 | 52,27 | 29,78 |
| **Rata-rata** | | 19,68 | 11,23 | 19,86 | 11,28 | 39,54 | 22,51 | 19,77 | 11,26 |

**Perhitungan Anava**

Faktor Koreksi (FK) = (Total)2

r x b x a

= (59,56)2

2 x 5 x 3

= 118,23

JK Kelompok (JKK) = – FK

= – 118,23

= 0,0005

JK Total (JKT) = [(a1b1)2 +... + (a3b3)2] - FK

= [(2,09)2 + ... + (1,94)2] – 118,23

= 0,1981

JK(a) = - FK

= – 118,23

= 0,0220

JK(b) = – FK

= – 118,23

= 0,1271

JK(ab) = – FK – JKa - JKb

= – 118,23 – 0,0220– 0,1271

= 0,0377

JKG = JKT – JKK- JK(a) – JK(b) – JK (ab)

= 0,1981 – 0,0005 – 0,0220 - 0,1271 – 0,0377

= 0,0108

**Hasil Analisis Variasi (ANAVA )**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variansi | Db | JK | KT | F Hitung | | F Tabel |
| Kelompok | 1 | 0,0005 | 0,0005 | - | | - |
| A | 2 | 0,0220 | 0,0110 | 14,32 | **\*** | 2,73 |
| B | 4 | 0,1271 | 0,0318 | 41,29 | **\*** | 3,11 |
| AB | 8 | 0,0377 | 0,0047 | 6,12 | **\*** | 2,70 |
| Galat | 14 | 0,0108 | 0,0008 | \ |  |  |
| Total | 29 | 0,1981 |  |  |  |  |

Keterangan :\* = berpegaruh nyata

Kesimpulan :

Berdasarkan tabel ANAVA diketahui bahwa F hitung ≥ F tabel pada taraf 5% dapat disimpulkan bahwa faktor A (Waktu Pengukusan), faktor B (Perbandingan jumlah tepung komposit) serta interaksi AB (waktu pengukusan dan perbandingan jumlah tepung komposit) berpengaruh nyata terhadap rasa makaroni, sehingga perlu dilakukan uji lanjut. Uji yang digunakan adalah uji lanjut duncan.

**Uji Lanjut Duncan faktor A**

Sy A =

=

= 0,003

Tabel Uji lanjut Duncan Faktor A (Waktu Pengukusan)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Kode | Rata-Rata | Perlakuan | | | | | | Notasi |
| 1 | | 2 | | 3 | |
| - | - | a1 | 1,97 | - | |  |  |  |  | a |
| 3,03 | 0,0084 | a3 | 1,97 | 0,000 | tn | - |  |  |  | a |
| 3,18 | 0,0088 | a2 | 2,02 | 0,050 | \* | 0,050 | \* | - |  | b |

Keterangan : \*= Berpengaruh Nyata, tn = tidak berpengaruh nyata

Tabel Uji lanjut Duncan Faktor A (Waktu Pengukusan)

|  |  |  |  |
| --- | --- | --- | --- |
| Sampel | Waktu Pengukusan | Nilai Asli Rata- Rata | Taraf Nyata 5% |
| a1 | 5 | 3,63 | a |
| a2 | 10 | 3,42 | b |
| a3 | 15 | 3,40 | a |

Kesimpulan :

Berdasarkan tabel hasil uji lanjut Duncan dapat disimpulkan bahwa semakin lama waktu pengukusan terjadi peningkatan terhadap rasa makaroni yang nyata pada perlakuan a1 dan a3 terhadap a2 tetapi tidak pada a1 terhadap a3.

**Uji Lanjut Duncan Faktor B**

Sy A =

=

= 0,005

Tabel Uji Lanjut Duncan Faktor B (Perbandingan Jumlah Tepung Komposit)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Kode | Rata-Rata | Perlakuan | | | | | | | | | Notasi |
| 1 | | 2 | | 3 | | 4 |  | 5 |
| - | - | b5 | 1,880 | - | |  |  |  |  |  |  |  | A |
| 3,03 | 0,0140 | b3 | 1,960 | 0,080 | \* | - |  |  |  |  |  |  | B |
| 3,18 | 0,0147 | b4 | 1,970 | 0,090 | \* | 0,010 | tn | - |  |  |  |  | B |
| 3,27 | 0,0151 | b2 | 2,040 | 0,160 | \* | 0,080 | \* | 0,070 | \* |  |  |  | C |
| 3,33 | 0,0154 | b1 | 2,060 | 0,180 | \* | 0,100 | \* | 0,090 | \* | 0,020 | \* |  | D |

Keterangan : \*= berpengaruh nyata, tn = tidak berpengaruh nyata

Tabel Uji Lanjut Duncan Faktor B (Perbandingan Jumlah Tepung Komposit)

|  |  |  |  |
| --- | --- | --- | --- |
| Sampel | Perbandingan Jumlah Tepung Komposit | Nilai Asli Rata- Rata | Taraf Nyata 5% |
|
| b1 | (10 : 0 : 0) | 3,81 | D |
| b2 | (8 : 1 : 1) | 3,69 | C |
| b3 | (6 : 2 : 2) | 3,39 | B |
| b4 | (4 : 3 : 3) | 3,44 | B |
| b5 | (2 : 4 : 4) | 3,09 | A |

Kesimpulan :

Berdasarkan tabel hasil uji lanjut Duncan dapat disimpulkan bahwa semakin rendah perbandingan tepung singkong dan tepung kacang koro menyebabkan peningkatan terhadap rasa makaroni yang nyata pada perlakuan b5 terhadap b4, b3, b2 dan b1. Tetapi tidak pada b3 terhadap b4.

**Uji Lanjut Duncan Faktor AB**

Sy =

=

= 0,0138

Tabel Uji Lanjut Duncan Faktor AB (Interaksi waktu pengukusan terhadap perbandingan jumlah tepung komposit)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Kode | Rata-Rata | Perlakuan | | | | | | | | | | | | | | | Notasi |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| - | - | a2b5 | 1,81 | - |  |  |  |  |  |  |  |  |  |  |  |  |  |  | a |
| 3,03 | 0,042 | a3b3 | 1,91 | 0,10\* | - |  |  |  |  |  |  |  |  |  |  |  |  |  | b |
| 3,18 | 0,044 | a3b5 | 1,91 | 0,10\* | 0,0tn | - |  |  |  |  |  |  |  |  |  |  |  |  | b |
| 3,27 | 0,045 | a1b5 | 1,92 | 0,11\* | 0,01tn | 0,01tn | - |  |  |  |  |  |  |  |  |  |  |  | b |
| 3,33 | 0,046 | a2b4 | 1,92 | 0,11\* | 0,01tn | 0,01tn | 0,0tn | - |  |  |  |  |  |  |  |  |  |  | b |
| 3,37 | 0,047 | a3b2 | 1,95 | 0,14\* | 0,04tn | 0,04tn | 0,03tn | 0,03tn | - |  |  |  |  |  |  |  |  |  | bc |
| 3,39 | 0,047 | a1b3 | 1,99 | 0,18\* | 0,08\* | 0,08\* | 0,07\* | 0,07\* | 0,04tn | - |  |  |  |  |  |  |  |  | cd |
| 3,41 | 0,047 | a2b3 | 1,99 | 0,18\* | 0,08\* | 0,08\* | 0,07\* | 0,07\* | 0,04tn | 0,0tn | - |  |  |  |  |  |  |  | cd |
| 3,42 | 0,047 | a1b4 | 2,0 | 0,19\* | 0,09\* | 0,09\* | 0,08\* | 0,08\* | 0,05\* | 0,01tn | 0,01tn | - |  |  |  |  |  |  | d |
| 3,44 | 0,048 | a3b4 | 2,0 | 0,19\* | 0,09\* | 0,09\* | 0,08\* | 0,08\* | 0,05\* | 0,01tn | 0,01tn | 0,0tn | - |  |  |  |  |  | d |
| 3,445 | 0,048 | a3b1 | 2,05 | 0,24\* | 0,14\* | 0,14\* | 0,13\* | 0,13\* | 0,10\* | 0,06\* | 0,06tn | 0,05\* | 0,05\* | - |  |  |  |  | e |
| 3,45 | 0,048 | a2b1 | 2,06 | 0,25\* | 0,15\* | 0,15\* | 0,14\* | 0,14\* | 0,11\* | 0,07\* | 0,07\* | 0,06\* | 0,06\* | 0,01tn | - |  |  |  | e |
| 3,455 | 0,048 | a2b2 | 2,06 | 0,25\* | 0,15\* | 0,15\* | 0,14\* | 0,14\* | 0,11\* | 0,07\* | 0,07\* | 0,06\* | 0,06\* | 0,01tn | 0,0tn | - |  |  | e |
| 3,46 | 0,048 | a1b1 | 2,09 | 0,28\* | 0,18\* | 0,18\* | 0,17\* | 0,17\* | 0,14\* | 0,1\* | 0,10\* | 0,09\* | 0,09\* | 0,04tn | 0,03tn | 0,03tn | - |  | ef |
| 3,46 | 0,048 | a1b2 | 2,11 | 0,30\* | 0,20\* | 0,20\* | 0,19\* | 0,19\* | 0,16\* | 0,12\* | 0,12\* | 0,11\* | 0,11\* | 0,06\* | 0,05\* | 0,05\* | 0,02tn | - | f |

Tabel dua arah (Two Way) untuk A sama B yang berbeda

Interaksi a1 terhadap b

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 | | 4 | | 5 |
| - | - | a1b5 | 1,92 | - |  | - |  | - |  |  |  |  | a |
| 3,03 | 0,0420 | a1b3 | 1,99 | 0,070 | \* | - |  | - |  |  |  |  | b |
| 3,18 | 0,0441 | a1b4 | 2,00 | 0,080 | \* | 0,010 | tn | - |  |  |  |  | b |
| 3,27 | 0,0454 | a1b1 | 2,09 | 0,170 | \* | 0,100 | \* | 0,090 | \* | - |  |  | c |
| 3,30 | 0,0458 | a1b2 | 2,11 | 0,190 | \* | 0,120 | \* | 0,110 | \* | 0,020 | tn | - | c |

Interaksi a2 terhadap b

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 | | 4 | | 5 |
| - | - | a2b5 | 1,81 | - |  | - |  | - |  |  |  |  | a |
| 3,03 | 0,0420 | a2b4 | 1,92 | 0,110 | \* | - |  | - |  |  |  |  | b |
| 3,18 | 0,0441 | a2b3 | 1,99 | 0,180 | \* | 0,070 | \* | - |  |  |  |  | c |
| 3,27 | 0,0454 | a2b1 | 2,06 | 0,250 | \* | 0,140 | \* | 0,070 | \* | - |  |  | d |
| 3,30 | 0,0458 | a2b2 | 2,06 | 0,250 | \* | 0,140 | \* | 0,070 | \* | 0,000 | \* | - | e |

Interaksi a3 terhadap b

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 | | 4 | | 5 |
| - | - | a3b3 | 1,91 | - |  | - |  | - |  |  |  |  | a |
| 3,03 | 0,0420 | a3b5 | 1,91 | 0,000 | tn | - |  | - |  |  |  |  | a |
| 3,18 | 0,0441 | a3b2 | 1,95 | 0,040 | tn | 0,040 | tn | - |  |  |  |  | a |
| 3,27 | 0,0454 | a3b4 | 2,00 | 0,090 | \* | 0,090 | \* | 0,050 | \* | - |  |  | b |
| 3,30 | 0,0458 | a3b1 | 2,05 | 0,140 | \* | 0,140 | \* | 0,100 | \* | 0,050 | \* | - | c |

Tabel dua arah (Two Way) untuk A sama B yang berbeda

Interaksi b1 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a3b1 | 2,05 | - |  | - |  | - | A |
| 3,03 | 0,0420 | a2b1 | 2,06 | 0,010 | tn | - |  | - | A |
| 3,18 | 0,0441 | a1b1 | 2,09 | 0,040 | tn | 0,030 | tn | - | A |

Interaksi b2 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a3b2 | 1,95 | - |  | - |  | - | A |
| 3,03 | 0,0420 | a2b2 | 2,06 | 0,110 | \* | - |  | - | B |
| 3,18 | 0,0441 | a1b2 | 2,11 | 0,160 | \* | 0,050 | \* | - | C |

Interaksi b3 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a3b3 | 1,91 | - |  | - |  | - | A |
| 3,03 | 0,0420 | a1b3 | 1,99 | 0,080 | \* | - |  | - | B |
| 3,18 | 0,0441 | a2b3 | 1,99 | 0,080 | \* | 0,000 | tn | - | B |

Interaksi b4 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a2b4 | 1,92 | - |  | - |  | - | A |
| 3,03 | 0,0420 | a1b4 | 2,00 | 0,080 | \* | - |  | - | B |
| 3,18 | 0,0441 | a3b4 | 2,00 | 0,080 | \* | 0,000 | tn | - | B |

Interaksi b5 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a2b5 | 1,81 | - |  | - |  | - | A |
| 3,03 | 0,0420 | a3b5 | 1,91 | 0,100 | tn | - |  | - | A |
| 3,18 | 0,0441 | a2b5 | 1,92 | 0,110 | \* | 0,010 | \* | - | B |

**Tabel Dwi Arah Pengaaruh Waktu Pengukusan dan Perbandingan Jumlah Tepung Komposit Terhadap Rasa Makaroni**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Waktu Pengukusan | Jumlah Perbandingan Tepung Komposit | | | | |
| b1 (10;0;0) | b2(8;1;1) | b3(6;2;2) | b4(4;3;3) | b5(2;4;4) |
| a1 (t= 5) | A | **C** | B | B | B |
| 3,90 | **4,00** | 3,48 | 3,55 | 3,23 |
| c | **c** | b | b | a |
| a2 (t= 10) | A | B | B | A | A |
| 3,77 | 3,75 | 3,50 | 3,23 | 2,83 |
| d | d | c | b | a |
| a3(t = 15) | A | A | A | B | A |
| 3,75 | 3,33 | 3,18 | 3,55 | 3,20 |
| c | a | a | b | a |

**Lampiran 11 : Data Analisis Respon Kimia Penelitian Utama**

**1. Data Hasil Analisis Kadar Air Makaroni**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Kode Sampel** | | **Berat Cawan Kosong** | **Berat Cawan + Sampel** | **Berat Sampel** | **Kadar Air**  **%** |
| **A** | **B** | **C** |
| 623 | a1b1 | 29,89 | 30,79 | 1,01 | 10,89 |
| 410 | a1b2 | 28,17 | 29,09 | 1,03 | 10,68 |
| 133 | a1b3 | 22,62 | 23,52 | 1,00 | 10,00 |
| 508 | a1b4 | 21,69 | 22,60 | 1,01 | 9,90 |
| 764 | a1b5 | 31,06 | 32,01 | 1,04 | 8,65 |
| 741 | a2b1 | 28,17 | 29,08 | 1,02 | 10,78 |
| 056 | a2b2 | 29,89 | 30,83 | 1,05 | 10,48 |
| 510 | a2b3 | 22,35 | 23,33 | 1,09 | 10,09 |
| 197 | a2b4 | 22,34 | 23,26 | 1,03 | 10,68 |
| 165 | a2b5 | 22,62 | 23,56 | 1,04 | 9,62 |
| 634 | a3b1 | 23,77 | 24,71 | 1,08 | 12,96 |
| 423 | a3b2 | 28,15 | 29,04 | 1,00 | 11,00 |
| 456 | a3b3 | 22,73 | 23,64 | 1,02 | 10,78 |
| 149 | a3b4 | 28,15 | 29,07 | 1,02 | 9,80 |
| 067 | a3b5 | 21,69 | 22,64 | 1,04 | 8,65 |
| 163 | a1b1 | 22,62 | 23,70 | 1,20 | 10,00 |
| 232 | a1b2 | 28,17 | 29,07 | 1,01 | 10,89 |
| 405 | a1b3 | 29,89 | 30,82 | 1,04 | 10,58 |
| 424 | a1b4 | 22,62 | 23,58 | 1,07 | 10,28 |
| 247 | a1b5 | 31,06 | 32,02 | 1,05 | 8,57 |
| 057 | a2b1 | 31,06 | 31,95 | 1,02 | 12,75 |
| 568 | a2b2 | 28,17 | 29,08 | 1,02 | 10,78 |
| 055 | a2b3 | 22,35 | 23,26 | 1,02 | 10,78 |
| 307 | a2b4 | 21,69 | 22,63 | 1,04 | 9,62 |
| 547 | a2b5 | 29,89 | 30,84 | 1,05 | 9,52 |
| 316 | a3b1 | 23,77 | 24,71 | 1,08 | 12,96 |
| 128 | a3b2 | 28,15 | 29,08 | 1,05 | 11,43 |
| 107 | a3b3 | 22,73 | 23,65 | 1,03 | 10,68 |
| 611 | a3b4 | 28,15 | 29,12 | 1,07 | 9,35 |
| 570 | a3b5 | 21,69 | 22,64 | 1,05 | 9,52 |

**Data Hasil Analisis Kadar Air Makaroni**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Waktu Pengukusan (A)** | **Perbandingan Jumlah Tepung Komposit (B)** | **Kelompok Ulangan** | | **Total** | **Rata -rata** |
| **1** | **2** |
| **a1 = 5 menit** | **b1 (10:0:0)** | 10,89 | 10,00 | 20,89 | 10,45 |
| **b2 (8:1:1)** | 10,68 | 10,89 | 21,57 | 10,79 |
| **b3 (6:2:2)** | 10,00 | 10,58 | 20,58 | 10,29 |
| **b4 (4:3:3)** | 9,90 | 10,28 | 20,18 | 10,09 |
| **b5 (2:4:4)** | 8,65 | 8,57 | 17,23 | 8,61 |
| **Sub Total** | | 50,13 | 50,32 | 100,45 | 50,22 |
| **Rata-Rata** | | 10,03 | 10,06 | 20,09 | 10,04 |
| **a2 = 10 menit** | **b1 (10:0:0)** | 10,78 | 12,75 | 23,53 | 11,76 |
| **b2 (8:1:1)** | 10,48 | 10,78 | 21,26 | 10,63 |
| **b3 (6:2:2)** | 10,09 | 10,78 | 20,88 | 10,44 |
| **b4 (4:3:3)** | 10,68 | 9,62 | 20,29 | 10,15 |
| **b5 (2:4:4)** | 9,62 | 9,52 | 19,14 | 9,57 |
| **Sub Total** | | 51,65 | 53,45 | 105,10 | 52,55 |
| **Rata-Rata** | | 10,33 | 10,69 | 21,02 | 10,51 |
| **a3 = 15 menit** | **b1 (10:0:0)** | 12,96 | 12,96 | 25,93 | 12,96 |
| **b2 (8:1:1)** | 11,00 | 11,43 | 22,43 | 11,21 |
| **b3 (6:2:2)** | 10,78 | 10,68 | 21,46 | 10,73 |
| **b4 (4:3:3)** | 9,80 | 9,35 | 19,15 | 9,57 |
| **b5 (2:4:4)** | 8,65 | 9,52 | 18,18 | 9,09 |
| **Sub Total** | | 53,21 | 53,94 | 107,15 | 53,57 |
| **Rata-rata** | | 10,64 | 10,79 | 21,43 | 10,71 |
| **Total** | | 154,98 | 157,71 | 312,69 | 156,35 |
| **Rata-rata** | | 58,44 | 59,49 | 117,93 | 58,97 |

**Perhitungan Anava**

Faktor Koreksi (FK) = (Total)2

r x b x a

= (312,691)2

2 x 5 x 3

= 3.259,2

JK Kelompok (JKK) = – FK

= – 3.259,2

= 0,2495

JK Total (JKT) = [(a1b1)2 +... + (a3b3)2] - FK

= [(10,89)2 + ... + (9,52)2] – 3.259,2 = 65,1060

JK(a) = - FK

= – 3.259,2

= 2,3583

JK(b) = – FK

= – 3.259,2

= 23,4894

JK(ab) = – FK – JKa - JKb

= – 3.259,2 – 2,3583 – 23,4894

= 5,8677

JKG = JKT – JKK- JK(a) – JK(b) – JK (ab)

= 35,7373 – 0,2495 – 2,3583 -23,4894 – 5,8677

= 3,7725

**Hasil Analisis Variasi (ANAVA )**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variansi** | **db** | **JK** | **KT** | **F Hitung** | | **F Tabel** |
| **Kelompok** | 1 | 0,2495 | 0,2495 | - | | - |
| **A** | 2 | 2,3583 | 1,1791 | 4,38 | **\*** | 2,73 |
| **B** | 4 | 23,4894 | 5,8724 | 21,79 | **\*** | 3,11 |
| **AB** | 8 | 5,8677 | 0,7335 | 2,72 | **\*** | 2,70 |
| **Galat** | 14 | 3,7725 | 0,2695 |  |  |  |
| **Total** | 29 | 35,7373 |  |  |  |  |

Keterangan :\* = berpegaruh nyata

Kesimpulan :

Berdasarkan tabel ANAVA diketahui bahwa Fhitung ≥ Ftabel pada taraf 5% maka dapat disimpulkan bahwa waktu pengukusan (A), perbandingan jumlah tepung komposit (B) dan interaksi antara waktu pengukusan dan perbandingan jumlah tepung komposit (AB) berpengaruh nyata terhadap kadar air makaroni, sehingga perlu dilakukan uji lanjut Duncan.

**Uji Lanjut Duncan faktor A**

Sy A =

=

= 0,052

Tabel Uji Lanjut Duncan Faktor A ( Waktu Pengukusan)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SSR 5%** | **LSR 5%** | **Kode** | **Rata-Rata** | **Perlakuan** | | | | | | **Notasi** |
| **1** | | **2** | | **3** | |
| - | - | a1 | 10,05 | - | |  |  |  |  | a |
| 3,03 | 0,1573 | a3 | 10,51 | 0,465 | \* | - |  |  |  | b |
| 3,18 | 0,1651 | a2 | 10,72 | 0,670 | \* | 0,670 | \* | - |  | c |

Keterangan : \*= Berpengaruh nyata

Tabel Uji Lanjut Duncan Faktor A ( Waktu Pengukusan)

|  |  |  |  |
| --- | --- | --- | --- |
| Sampel | Waktu Pengukusan | Nilai Asli Rata- Rata | Taraf Nyata 5% |
| a1 | 5 | 10,04 | a |
| a2 | 10 | 10,51 | b |
| a3 | 15 | 10,71 | c |

Kesimpulan :

Berdasarkan tabel hasil uji lanjut Duncan dapat disimpulkan bahwa semakin lama waktu pengukusan terjadi peningkatan kadar air makaroni yang nyata pada perlakuan a1 terhadap a2 dan a3.

**Uji Lanjut Duncan Faktor B**

Sy B =

=

= 0,087

Tabel Uji Lanjut Duncan Faktor B (Perbandingan Jumlah Tepung Komposit)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Kode | Rata-Rata | Perlakuan | | | | | | | | | Notasi |
| 1 | | 2 | | 3 | | 4 |  | 5 |
| - | - | b1 | 9,090 | - | |  |  |  |  |  |  |  | a |
| 3,03 | 0,2621 | b2 | 9,940 | 0,850 | \* | - |  |  |  |  |  |  | b |
| 3,18 | 0,2751 | b3 | 10,490 | 1,400 | \* | 0,550 | \* | - |  |  |  |  | c |
| 3,27 | 0,2829 | b4 | 10,880 | 1,790 | \* | 0,940 | \* | 0,390 | \* |  |  |  | d |
| 3,33 | 0,2881 | b5 | 11,720 | 2,630 | \* | 1,780 | \* | 1,230 | \* | 0,840 | \* |  | e |

Keterangan : \*= Berpengaruh Nyata

Tebel Uji Lanjut Duncan Faktor B ( Perbandingan Jumlah Tepung Komposit)

|  |  |  |  |
| --- | --- | --- | --- |
| Sampel | Perbandingan Jumlah Tepung Komposit | Nilai Asli Rata- Rata | Taraf Nyata 5% |
|
| b1 | (10 : 0 : 0) | 11,72 | a |
| b2 | (8 : 1 : 1) | 10,88 | b |
| b3 | (6 : 2 : 2) | 10,49 | c |
| b4 | (4 : 3 : 3) | 9,94 | d |
| b5 | (2 : 4 : 4) | 9,09 | e |

Kesimpulan :

Berdasarkan tabel hasil uji lanjut Duncan dapat disimpulkan bahwa semakin tinggi perbandingan tepung singkong dan tepung kacang koro terjadi penurunan kadar air makaroni yang nyata pada perlakuan b1 terhadap b2, b3, b4 dan b5.

**Uji Lanjut Duncan Faktor AB**

Sy A =

=

= 0,3018

Tebel Uji Lanjut Duncan Faktor AB ( Interaksi Waktu Pengukusan Terhadap Perbandingan Jumlah Tepung Komposit)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Kode | Rata-Rata | Perlakuan | | | | | | | | | | | | | | | Notasi |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| - | - | a1b5 | 8,61 | - |  |  |  |  |  |  |  |  |  |  |  |  |  |  | a |
| 3,03 | 0,786 | a3b5 | 9,09 | 0,476tn | - |  |  |  |  |  |  |  |  |  |  |  |  |  | a |
| 3,18 | 0,825 | a2b5 | 9,57 | 0,957tn | 0,481tn | - |  |  |  |  |  |  |  |  |  |  |  |  | ab |
| 3,27 | 0,849 | a3b4 | 9,57 | 0,962tn | 0,486tn | 0,005tn | - |  |  |  |  |  |  |  |  |  |  |  | abc |
| 3,33 | 0,864 | a1b4 | 10,09 | 1,478\* | 1,002\* | 0,521tn | 0,516tn | - |  |  |  |  |  |  |  |  |  |  | bcd |
| 3,37 | 0,875 | a2b4 | 10,15 | 1,535\* | 1,059\* | 0,578tn | 0,573tn | 0,057tn | - |  |  |  |  |  |  |  |  |  | bcd |
| 3,39 | 0,88 | a1b3 | 10,29 | 1,676\* | 1,20\* | 0,719tn | 0,714tn | 0,198tn | 0,141tn | - |  |  |  |  |  |  |  |  | bcd |
| 3,41 | 0,885 | a2b3 | 10,44 | 1,825\* | 1,349\* | 0,868tn | 0,863tn | 0,347tn | 0,291tn | 0,15tn | - |  |  |  |  |  |  |  | bcde |
| 3,42 | 0,888 | a1b1 | 10,45 | 1,833\* | 1,357\* | 0,876\* | 0,871tn | 0,355tn | 0,298tn | 0,157tn | 0,008tn | - |  |  |  |  |  |  | cde |
| 3,44 | 0,893 | a2b2 | 10,63 | 2,018\* | 1,541\* | 1,061\* | 1,055\* | 0,54tn | 0,483tn | 0,342tn | 0,192tn | 0,185tn | - |  |  |  |  |  | de |
| 3,445 | 0,894 | a3b3 | 10,73 | 2,119\* | 1,643\* | 1,162\* | 1,157\* | 0,641tn | 0,584tn | 0,444tn | 0,294tn | 0,286tn | 0,102tn | - |  |  |  |  | de |
| 3,45 | 0,895 | a1b2 | 10,79 | 2,173\* | 1,697\* | 1,216\* | 1,21\* | 0,695tn | 0,638tn | 0,497tn | 0,347tn | 0,34tn | 0,155tn | 0,053tn | - |  |  |  | de |
| 3,455 | 0,897 | a3b2 | 11,21 | 2,602\* | 2,125\* | 1,645\* | 1,639\* | 1,124\* | 1,067\* | 0,926\* | 0,776tn | 0,769tn | 0,584tn | 0,482tn | 0,429tn | - |  |  | ef |
| 3,46 | 0,898 | a2b1 | 11,76 | 3,152\* | 2,676\* | 2,195\* | 2,19\* | 1,674\* | 1,617\* | 1,476\* | 1,327\* | 1,319\* | 1,134\* | 1,033\* | 0,979\* | 0,55tn | - |  | f |
| 3,46 | 0,898 | a3b1 | 12,96 | 4,35\* | 3,874\* | 3,393\* | 3,388\* | 2,872\* | 2,815\* | 2,675\* | 2,525\* | 2,517\* | 2,333\* | 2,231\* | 2,178\* | 1,749\* | 1,198\* | - | g |

Tabel dua arah (Two Way) untuk A sama B yang berbeda

Interaksi a1 terhadap b

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 | | 4 | | 5 |
| - | - | a1b5 | 8,61 | - |  | - |  | - |  |  |  |  | a |
| 3,03 | 0,7864 | a1b4 | 10,09 | 1,478 | \* | - |  | - |  |  |  |  | b |
| 3,18 | 0,8254 | a1b3 | 10,29 | 1,676 | \* | 0,198 | tn | - |  |  |  |  | b |
| 3,27 | 0,8487 | a1b1 | 10,45 | 1,833 | \* | 0,355 | tn | 0,157 | tn | - |  |  | b |
| 3,30 | 0,8565 | a1b2 | 10,79 | 2,173 | \* | 0,695 | tn | 0,497 | tn | 0,340 | tn | - | b |

Interaksi a2 terhadap b

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 | | 4 | | 5 |
| - | - | a2b5 | 9,5696 | - |  | - |  | - |  |  |  |  | a |
| 3,03 | 0,7864 | a2b4 | 10,147 | 0,578 | tn | - |  | - |  |  |  |  | a |
| 3,18 | 0,8254 | a2b3 | 10,438 | 0,868 | \* | 0,291 | tn | - |  |  |  |  | b |
| 3,27 | 0,8487 | a2b2 | 10,63 | 1,061 | \* | 0,483 | tn | 0,192 | tn | - |  |  | b |
| 3,30 | 0,8565 | a2b1 | 11,765 | 2,195 | \* | 1,617 | \* | 1,327 | \* | 1,134 | \* | - | c |

Interaksi a3 terhadap b

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 | | 4 | | 5 |
| - | - | a3b5 | 9,089 | - |  | - |  | - |  |  |  |  | a |
| 3,03 | 0,7864 | a3b4 | 9,575 | 0,486 | tn | - |  | - |  |  |  |  | a |
| 3,18 | 0,8254 | a3b3 | 10,732 | 1,643 | \* | 1,157 | \* | - |  |  |  |  | b |
| 3,27 | 0,8487 | a3b2 | 11,214 | 2,125 | \* | 1,639 | \* | 0,482 | tn | - |  |  | b |
| 3,30 | 0,8565 | a3b1 | 12,963 | 3,874 | \* | 3,388 | \* | 2,231 | \* | 1,749 | \* | - | c |

Tabel dua arah (Two Way) untuk B sama A yang berbeda

Interaksi b1 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a1b1 | 10,4 | - |  | - |  | - | A |
| 3,03 | 0,7864 | a2b1 | 11,8 | 1,319 | \* | - |  | - | B |
| 3,18 | 0,8254 | a3b1 | 13,0 | 2,517 | \* | 1,198 | \* | - | C |

Interaksi b2 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a2b2 | 10,6 | - |  | - |  | - | A |
| 3,03 | 0,7864 | a1b2 | 10,8 | 0,155 | tn | - |  | - | A |
| 3,18 | 0,8254 | a3b2 | 11,2 | 0,584 | tn | 0,429 | tn | - | A |

Interaksi b3 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a1b3 | 10,3 | - |  | - |  | - | A |
| 3,03 | 0,7864 | a2b3 | 10,4 | 0,150 | tn | - |  | - | A |
| 3,18 | 0,8254 | a3b3 | 10,7 | 0,444 | tn | 0,294 | tn | - | A |

Interaksi b4 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a3b4 | 9,58 | - |  | - |  | - | A |
| 3,03 | 0,7864 | a1b4 | 10,09 | 0,510 | tn | - |  | - | A |
| 3,18 | 0,8254 | a2b4 | 10,15 | 0,570 | tn | 0,060 | tn | - | A |

Interaksi b5 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a1b5 | 8,16 | - |  | - |  | - | A |
| 3,03 | 0,7864 | a3b5 | 9,09 | 0,930 | tn | - |  | - | A |
| 3,18 | 0,8254 | a2b5 | 9,57 | 1,410 | \* | 0,480 | tn | - | B |

**Tabel Waktu Pengukusan dan Perbandingan Jumlah Tepung Komposit Terhadap Kadar Air**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Waktu Pengukusan | Jumlah Perbandingan Tepung Komposit | | | | |
| b1 (10;0;0) | b2(8;1;1) | b3(6;2;2) | b4(4;3;3) | b5(2;4;4) |
| a1 (t= 5) | A | A | A | A | **A** |
| 10,45 | 10,79 | 10,29 | 10,09 | **8,61** |
| b | b | B | b | **a** |
| a2 (t= 10) | B | A | A | A | B |
| 11,76 | 10,63 | 10,44 | 10,15 | 9,57 |
| c | b | B | a | a |
| a3(t = 15) | C | A | A | A | A |
| 12,96 | 11,21 | 10,73 | 9,57 | 9,09 |
| c | b | B | a | a |

**2. Data Hasil Analisis Kadar Karbohidrat (Pati)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Kode Sampel** | | **Berat Sampel** | | **Vt** | **% Glukosa Sebelum inversi** | **mg Glukosa Setelah Inversi** | **% Gula Setelah Invert** | **Kadar Pati** |
| **G** | **mg** |
| 623 | a1b1 | 1,03 | 1030,0 | 3,30 | 6,67 | 16,38 | 79,49 | 73,49 |
| 410 | a1b2 | 1,02 | 1020,0 | 3,50 | 6,46 | 15,85 | 77,70 | 71,88 |
| 133 | a1b3 | 1,01 | 1010,0 | 3,45 | 6,52 | 15,95 | 78,96 | 73,10 |
| 508 | a1b4 | 1,02 | 1020,0 | 3,30 | 6,67 | 16,38 | 80,27 | 74,27 |
| 764 | a1b5 | 1,01 | 1010,0 | 3,25 | 6,72 | 16,50 | 81,68 | 75,63 |
| 741 | a2b1 | 1,08 | 1080,0 | 3,40 | 6,57 | 16,13 | 74,65 | 68,74 |
| 056 | a2b2 | 1,08 | 1080,0 | 3,20 | 6,77 | 16,63 | 76,97 | 70,87 |
| 510 | a2b3 | 1,05 | 1050,0 | 3,20 | 6,77 | 16,63 | 79,17 | 73,07 |
| 197 | a2b4 | 1,02 | 1020,0 | 3,20 | 6,77 | 16,63 | 81,50 | 75,40 |
| 165 | a2b5 | 1,03 | 1030,0 | 3,40 | 6,57 | 16,13 | 78,28 | 72,37 |
| 634 | a3b1 | 1,03 | 1030,0 | 3,90 | 6,05 | 14,83 | 71,99 | 66,54 |
| 423 | a3b2 | 1,04 | 1040,0 | 3,85 | 6,10 | 14,95 | 71,88 | 66,38 |
| 456 | a3b3 | 1,06 | 1060,0 | 3,45 | 6,52 | 16,00 | 75,47 | 69,61 |
| 149 | a3b4 | 1,08 | 1080,0 | 2,90 | 7,08 | 17,40 | 80,56 | 74,18 |
| 067 | a3b5 | 1,09 | 1090,0 | 3,50 | 6,46 | 15,85 | 72,71 | 66,89 |
| 163 | a1b1 | 1,07 | 1070,0 | 3,6 | 6,36 | 15,60 | 72,90 | 67,17 |
| 232 | a1b2 | 1,22 | 1220,0 | 3,1 | 6,87 | 19,38 | 79,41 | 73,22 |
| 405 | a1b3 | 1,04 | 1040,0 | 3,2 | 6,77 | 16,63 | 79,93 | 73,83 |
| 424 | a1b4 | 1,01 | 1010,0 | 3,2 | 6,77 | 16,63 | 82,30 | 76,21 |
| 247 | a1b5 | 1,03 | 1030,0 | 3,2 | 6,77 | 16,63 | 80,70 | 74,61 |
| 057 | a2b1 | 1,09 | 1090,0 | 3,1 | 6,87 | 16,88 | 77,41 | 71,22 |
| 568 | a2b2 | 1,09 | 1090,0 | 3,05 | 6,93 | 17,03 | 78,10 | 71,86 |
| 055 | a2b3 | 1,08 | 1080,0 | 3,2 | 6,77 | 16,63 | 76,97 | 70,87 |
| 307 | a2b4 | 1,06 | 1060,0 | 3,05 | 6,93 | 17,03 | 80,31 | 74,07 |
| 547 | a2b5 | 1,03 | 1030,0 | 3,3 | 6,67 | 16,38 | 79,49 | 73,49 |
| 316 | a3b1 | 1,02 | 1020,0 | 3,8 | 6,16 | 15,10 | 74,02 | 68,48 |
| 128 | a3b2 | 1,04 | 1040,0 | 3,5 | 6,46 | 15,85 | 76,20 | 70,38 |
| 107 | a3b3 | 1,02 | 1020,0 | 3,7 | 6,26 | 15,35 | 75,25 | 69,61 |
| 611 | a3b4 | 1,02 | 1020,0 | 3,25 | 6,72 | 16,50 | 80,88 | 74,83 |
| 570 | a3b5 | 1,05 | 1050,0 | 3,2 | 6,77 | 16,64 | 79,24 | 73,14 |

**Data Hasil Analisis Kadar Karbohidrat Pati Makaroi**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Waktu Pengukusan (A)** | **Perbandingan Jumlah Tepung Komposit (B)** | **Kelompok Ulangan** | | **Total** | **Rata -rata** |
| **1** | **2** |
| **a1 = 5 menit** | **b1 (10:0:0)** | 73,49 | 67,17 | 140,66 | 70,33 |
| **b2 (8:1:1)** | 71,88 | 73,22 | 145,10 | 72,55 |
| **b3 (6:2:2)** | 73,10 | 73,83 | 146,93 | 73,47 |
| **b4 (4:3:3)** | 74,27 | 76,21 | 150,48 | 75,24 |
| **b5 (2:4:4)** | 75,63 | 74,61 | 150,24 | 75,12 |
| **Sub Total** | | 368,37 | 365,04 | 733,41 | 366,70 |
| **Rata-Rata** | | 73,67 | 73,01 | 146,68 | 73,34 |
| **a2 = 10 menit** | **b1 (10:0:0)** | 68,74 | 71,22 | 139,96 | 69,98 |
| **b2 (8:1:1)** | 70,87 | 71,86 | 142,74 | 71,37 |
| **b3 (6:2:2)** | 73,07 | 70,87 | 143,95 | 71,97 |
| **b4 (4:3:3)** | 75,40 | 74,07 | 149,47 | 74,74 |
| **b5 (2:4:4)** | 72,37 | 73,49 | 145,86 | 72,93 |
| **Sub Total** | | 360,46 | 361,52 | 721,98 | 360,99 |
| **Rata-Rata** | | 72,09 | 72,30 | 144,40 | 72,20 |
| **a3 waktu pengukusan 15 menit** | **b1 (10:0:0)** | 66,54 | 68,48 | 135,02 | 67,51 |
| **b2 (8:1:1)** | 66,38 | 70,38 | 136,77 | 68,38 |
| **b3 (6:2:2)** | 69,61 | 69,61 | 139,22 | 69,61 |
| **b4 (4:3:3)** | 74,18 | 74,83 | 149,02 | 74,51 |
| **b5 (2:4:4)** | 66,89 | 73,14 | 140,03 | 70,02 |
| **Sub Total** | | 343,60 | 356,45 | 700,06 | 350,03 |
| **Rata-rata** | | 68,72 | 71,29 | 140,01 | 70,01 |
| **Total** | | 1072,43 | 1083,02 | 2155,44 | 1077,72 |
| **Rata-rata** | | 406,06 | 409,44 | 815,51 | 407,75 |

**Perhitungan Anava**

Faktor Koreksi (FK) = (Total)2

r x b x a

= (2155,)2

2 x 5 x 3

= 154.864,26

JK Kelompok (JKK) = – FK

= – 154.864,26

= 3,7375

JK Total (JKT) = [(a1b1)2 +... + (a3b3)2] - FK

= [(70,33)2 + ... + (70,02)2] – 154.864,26

= 234,92

JK(a) = - FK

= – 154.864,26

= 57,44

JK(b) = – FK

= – 154.864,26

= 104,42

JK(ab) = – FK – JKa - JKb

= –154.864,26 – 57,44-104,42

= 12,36

JKG = JKT – JKK- JK(a) – JK(b) – JK (ab)

= 234,92 – 3,7375 – 57,44 -104,42 –12,36

= 56,93

**Hasil Analisis Variasi (ANAVA )**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variansi | db | JK | KT | F Hitung | | F Tabel |
| Kelompok | 1 | 3,7375 | 3,7375 | - | | - |
| A | 2 | 57,4423 | 28,7211 | 7,06 | **\*** | 2,73 |
| B | 4 | 104,4424 | 26,1106 | 6,42 | **\*** | 3,11 |
| AB | 8 | 12,3619 | 1,5452 | 0,38 | **tn** | 2,70 |
| Galat | 14 | 56,9372 | 4,0669 |  |  |  |
| Total | 29 | 234,9214 |  |  |  |  |

Keterangan :\* = berpegaruh nyata, tn = tidak berpengaruh nyata

Kesimpulan :

Berdasarkan tabel ANAVA diketahui bahwa Fhitung ≥ Ftabel pada taraf 5% maka dapat disimpulkan bahwa waktu pengukusan (A) dan perbandingan jumlah tepung komposit (B) berpengaruh nyata terhadap kadar karbohidrat pati makaroni, sehingga perlu dilakukan uji lanjut Duncan, sedangkan interaksi antara waktu pengukusan dan perbandingan jumlah tepung komposit (AB) tidak berpengaruh nyata trhadap kadar karbohidrat pati makaroni sehingga tidak perlu dilakukan uji lanjut.

**Uji Lanjut Duncan faktor A**

Sy A =

=

= 0,202

Tabel Uji Lanjut Duncan Faktor A ( Waktu Pengukusan)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Kode | Rata-Rata | Perlakuan | | | | | | Notasi |
| 1 | | 2 | | 3 | |
| - | - | a3 | 70,01 | - | |  |  |  |  | a |
| 3,03 | 0,6111 | a2 | 72,20 | 2,190 | \* | - |  |  |  | b |
| 3,18 | 0,6413 | a1 | 72,34 | 2,330 | \* | 2,330 | \* | - |  | c |

Keterangan :\* = berpegaruh nyata

Tabel Uji Lanjut Duncan Faktor A ( Waktu Pengukusan)

|  |  |  |  |
| --- | --- | --- | --- |
| Sampel | Waktu Pengukusan | Nilai Asli Rata- Rata | Taraf Nyata 5% |
| a1 | 5 | 73,34 | c |
| a2 | 10 | 72,20 | b |
| a3 | 15 | 70,01 | a |

Kesimpulan :

Berdasarkan tabel hasil uji lanjut Duncan dapat disimpulkan bahwa semakin lama waktu pengukusan terjadi penurunan kadar karbohidrat pati yang nyata pada perlakuan a3 terhadap a2 dan a1.

**Uji Lanjut Duncan faktor B**

Sy B =

=

= 0,336

Tabel Uji Lanjut Duncan Faktor B ( Perbandingan Jumlah Tepung Komposit)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 | | 4 | | 5 |
| - | - | a3b1 | 67,51 | - |  | - |  | - |  |  |  |  | a |
| 3,03 | 3,0553 | a3b2 | 68,38 | 0,870 | tn | - |  | - |  |  |  |  | a |
| 3,18 | 3,2065 | a3b3 | 69,61 | 2,100 | tn | 1,230 | tn | - |  |  |  |  | a |
| 3,27 | 3,2973 | a3b5 | 70,01 | 2,500 | tn | 1,630 | tn | 0,400 | tn | - |  |  | a |
| 3,30 | 3,3275 | a3b4 | 74,50 | 6,990 | \* | 6,120 | \* | 4,890 | \* | 4,490 | \* | - | b |

Keterangan :\* = berpegaruh nyata tn = tidak berpengaruh nyata

Tabel Uji Lanjut Duncan Faktor B ( Perbandingan Jumlah Tepung Komposit)

|  |  |  |  |
| --- | --- | --- | --- |
| Sampel | Perbandingan Jumlah Tepung Komposit | Nilai Asli Rata- Rata | Taraf Nyata 5% |
|
| b1 | (10 : 0 : 0) | 69,27 | a |
| b2 | (8 : 1 : 1) | 70,77 | a |
| b3 | (6 : 2 : 2) | 71,68 | a |
| b4 | (4 : 3 : 3) | 74,83 | b |
| b5 | (2 : 4 : 4) | 72,69 | a |

Kesimpulan :

Berdasarkan tabel hasil uji lanjut Duncan dapat disimpulkan bahwa perbandingan tepung komposit tidak menghasilkan perbedaan yang nyata pada perlakuan b1 terhadap b2,, b3 dan b5, tetapi berbeda nyata pada perlakuan b4.

**3. Data Hasil Analisis Kadar Protein**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Kode Sampel** | | **Berat Sampel** | **V Blangko** | **V Titrasi** | **Kadar Protein** |
| **G** | **ml** | **ml** |
| 623 | a1b1 | 0,510 | 0,20 | 10,25 | 10,31 |
| 410 | a1b2 | 0,510 | 0,20 | 10,65 | 10,72 |
| 133 | a1b3 | 0,510 | 0,20 | 10,65 | 10,72 |
| 508 | a1b4 | 0,510 | 0,20 | 10,85 | 10,92 |
| 764 | a1b5 | 0,510 | 0,20 | 10,85 | 10,92 |
| 741 | a2b1 | 0,510 | 0,20 | 10,00 | 10,05 |
| 056 | a2b2 | 0,510 | 0,20 | 9,60 | 9,64 |
| 510 | a2b3 | 0,510 | 0,20 | 10,45 | 10,51 |
| 197 | a2b4 | 0,510 | 0,20 | 10,90 | 10,97 |
| 165 | a2b5 | 0,510 | 0,20 | 11,10 | 11,18 |
| 634 | a3b1 | 0,510 | 0,20 | 9,90 | 9,95 |
| 423 | a3b2 | 0,510 | 0,20 | 10,20 | 10,26 |
| 456 | a3b3 | 0,510 | 0,20 | 10,60 | 10,67 |
| 149 | a3b4 | 0,510 | 0,20 | 10,90 | 10,97 |
| 067 | a3b5 | 0,510 | 0,20 | 11,25 | 11,33 |
| 163 | a1b1 | 0,510 | 0,20 | 10,15 | 10,21 |
| 232 | a1b2 | 0,510 | 0,20 | 10,55 | 10,62 |
| 405 | a1b3 | 0,510 | 0,20 | 10,70 | 10,77 |
| 424 | a1b4 | 0,510 | 0,20 | 10,85 | 10,92 |
| 247 | a1b5 | 0,510 | 0,20 | 10,85 | 10,92 |
| 057 | a2b1 | 0,510 | 0,20 | 10,05 | 10,10 |
| 568 | a2b2 | 0,510 | 0,20 | 9,65 | 9,69 |
| 055 | a2b3 | 0,510 | 0,20 | 10,50 | 10,56 |
| 307 | a2b4 | 0,510 | 0,20 | 10,95 | 11,03 |
| 547 | a2b5 | 0,510 | 0,20 | 11,10 | 11,18 |
| 316 | a3b1 | 0,510 | 0,20 | 9,95 | 10,00 |
| 128 | a3b2 | 0,510 | 0,20 | 10,20 | 10,26 |
| 107 | a3b3 | 0,510 | 0,20 | 10,65 | 10,72 |
| 611 | a3b4 | 0,510 | 0,20 | 11,95 | 12,05 |
| 570 | a3b5 | 0,510 | 0,20 | 11,30 | 11,38 |

**Data Hasil Analisis Kadar Protein Makaroni**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Waktu Pengukusan (A)** | **Perbandingan Jumlah Tepung Komposit (B)** | **Kelompok Ulangan** | | **Total** | **Rata -rata** |
| **1** | **2** |
| **a1 = 5 menit** | **b1 (10:0:0)** | 10,31 | 10,21 | 20,51 | 10,26 |
| **b2 (8:1:1)** | 10,72 | 10,62 | 21,33 | 10,67 |
| **b3 (6:2:2)** | 10,72 | 10,77 | 21,49 | 10,74 |
| **b4 (4:3:3)** | 10,92 | 10,92 | 21,85 | 10,92 |
| **b5 (2:4:4)** | 10,92 | 10,92 | 21,85 | 10,92 |
| **Sub Total** | | 53,59 | 53,44 | 107,03 | 53,51 |
| **Rata-Rata** | | 10,72 | 10,69 | 21,41 | 10,70 |
| **a2 = 10 menit** | **b1 (10:0:0)** | 10,05 | 10,10 | 20,15 | 10,08 |
| **b2 (8:1:1)** | 9,64 | 9,69 | 19,33 | 9,67 |
| **b3 (6:2:2)** | 10,51 | 10,56 | 21,08 | 10,54 |
| **b4 (4:3:3)** | 10,97 | 11,03 | 22,00 | 11,00 |
| **b5 (2:4:4)** | 11,18 | 11,18 | 22,36 | 11,18 |
| **Sub Total** | | 52,36 | 52,57 | 104,93 | 52,46 |
| **Rata-Rata** | | 10,47 | 10,51 | 20,99 | 10,49 |
| **a3 = 15 menit** | **b1 (10:0:0)** | 9,95 | 10,00 | 19,95 | 9,97 |
| **b2 (8:1:1)** | 10,26 | 10,26 | 20,51 | 10,26 |
| **b3 (6:2:2)** | 10,67 | 10,72 | 21,39 | 10,69 |
| **b4 (4:3:3)** | 10,97 | 12,05 | 23,03 | 11,51 |
| **b5 (2:4:4)** | 11,33 | 11,38 | 22,72 | 11,36 |
| **Sub Total** | | 53,18 | 54,41 | 107,59 | 53,80 |
| **Rata-rata** | | 10,64 | 10,88 | 21,52 | 10,76 |
| **Total** | | 159,13 | 160,41 | 319,55 | 159,77 |
| **Rata-rata** | | 60,11 | 60,54 | 120,65 | 60,32 |

**Perhitungan Anava**

Faktor Koreksi (FK) = (Total)2

r x b x a

= (319,54)2

2 x 5 x 3

= 3403,65

JK Kelompok (JKK) = – FK

= – 3404,65

= 0,0548

JK Total (JKT) = [(a1b1)2 +... + (a3b3)2] - FK

= [(10,26)2 + ... + (11,38)2] – 3404,65 = 8,3694

JK(a) = - FK

= – 3404,65

= 0,3950

JK(b) = – FK

= – 3404,56

= 6,0274

JK(ab) = – FK – JKa - JKb

= – 3404,56 – 0,3950 – 6,0274

= 1,3460

JKG = JKT – JKK- JK(a) – JK(b) – JK (ab)

= 8,3694 –0,0548 – 0,3950 – 6,0274 – 1,3460 = 0,5462

**Hasil Analisis Variasi (ANAVA )**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variansi | db | JK | KT | F Hitung | | F Tabel |
| Kelompok | 1 | 0,0548 | 0,0548 | - | | - |
| A | 2 | 0,3950 | 0,1975 | 5,06 | **\*** | 2,73 |
| B | 4 | 6,0274 | 1,5068 | 38,63 | **\*** | 3,11 |
| AB | 8 | 1,3460 | 0,1683 | 4,31 | **\*** | 2,70 |
| Galat | 14 | 0,5462 | 0,0390 | \ |  |  |
| Total | 29 | 8,3694 |  |  |  |  |

Keterangan :\* = berpegaruh nyata

Kesimpulan :

Berdasarkan tabel ANAVA diketahui bahwa Fhitung ≥ Ftabel pada taraf 5% maka dapat disimpulkan bahwa waktu pengukusan (A), perbandingan jumlah tepung komposit (B) dan interaksi antara waktu pengukusan dan perbandingan jumlah tepung komposit (AB) berpengaruh nyata terhadap kadar protein makaroni, sehingga perlu dilakukan uji lanjut, uji yang digunakan adalah uji lanjut Duncan.

**Uji Lanjut Duncan faktor A**

Sy A =

=

= 0,020

Tabel Uji Lanjut Duncan Faktor A (Waktu Pengukusan)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Kode | Rata-Rata | Perlakuan | | | | | | Notasi |
| 1 | | 2 | | 3 | |
| - | - | a2 | 10,49 | - | |  |  |  |  | a |
| 3,03 | 0,0598 | a3 | 10,70 | 0,210 | \* | - |  |  |  | b |
| 3,18 | 0,0628 | a1 | 10,75 | 0,260 | \* | 0,260 | \* | - |  | c |

Keterangan : \*= Berpengaruh Nyata

Tabel Uji Lanjut Duncan Faktor A (Waktu Penguukusan)

|  |  |  |  |
| --- | --- | --- | --- |
| Sampel | Waktu Pengukusan | Nilai Asli Rata- Rata | Taraf Nyata 5% |
| a1 | 5 | 10,70 | c |
| a2 | 10 | 10,49 | a |
| a3 | 15 | 10,76 | b |

Kesimpulan :

Berdasarkan tabel hasil uji lanjut Duncan dapat disimpulkan bahwa terjadi penurunan kadar protein makaroni yang nyata pada perlakuan a1 terhadap a2 dan a3, dan terjadi peningkatan kadar protein yang nyata pada perlakuan a2 terhadap a3.

**Uji Llanjut Duncan Faktor B**

Sy B =

=

= 0,033

Tabel Uji Lanjut Duncan Faktor B (Perbandingan Jumlah Tepung Komposit)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 | | 4 | | 5 |
| - | - | a3b1 | 9,97 | - |  | - |  | - |  |  |  |  | a |
| 3,03 | 0,2992 | a3b2 | 10,25 | 0,280 | tn | - |  | - |  |  |  |  | a |
| 3,18 | 0,3140 | a3b3 | 10,69 | 0,720 | \* | 0,440 | \* | - |  |  |  |  | b |
| 3,27 | 0,3229 | a3b5 | 11,35 | 1,380 | \* | 1,100 | \* | 0,660 | \* | - |  |  | c |
| 3,30 | 0,3259 | a3b4 | 11,51 | 1,540 | \* | 1,260 | \* | 0,820 | \* | 0,160 | \* | - | d |

Keterangan : \* = Berpaengaruh Nyata, tn = tidak berpengaruh nyata

Tabel Uji Lanjut Duncan Faktor B (Perbandingan Jumlah Tepung Komposit)

|  |  |  |  |
| --- | --- | --- | --- |
| Sampel | Perbandingan Jumlah Tepung Komposit | Nilai Asli Rata- Rata | Taraf Nyata 5% |
|
| b1 | (10 : 0 : 0) | 10,10 | a |
| b2 | (8 : 1 : 1) | 10,20 | a |
| b3 | (6 : 2 : 2) | 10,66 | b |
| b4 | (4 : 3 : 3) | 11,15 | d |
| b5 | (2 : 4 : 4) | 11,15 | c |

Kesimpulan :

Berdasarkan tabel hasil uji lanjut Duncan dapat disimpulkan bahwa semakin tinggi perbandingan tepung tepung singkong dan tepung kacang koro menghasilkan peningkatan kadar protein makaroni yang nyata pada perlakuan b1 terhadap b3, b4 dan b5 .tetapi tidak pada b1 terhadap b2.

**Uji Lanjut Duncan Faktor AB**

Sy A =

=

= 0,0987

Tabel Uji lanjut Duncan faktor AB (Interaksi waktu Pengukusan Terhadap Perbandingan Jumlah Tepung Komposit)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Kode | Rata-Rata | Perlakuan | | | | | | | | | | | | | | | Notasi |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| - | - | a2b2 | 9,67 | - |  |  |  |  |  |  |  |  |  |  |  |  |  |  | a |
| 3,03 | 0,299 | a3b1 | 9,97 | 0,30\* | - |  |  |  |  |  |  |  |  |  |  |  |  |  | b |
| 3,18 | 0,314 | a2b1 | 10,08 | 0,41\* | 0,10\* | - |  |  |  |  |  |  |  |  |  |  |  |  | c |
| 3,27 | 0,323 | a3b2 | 10,26 | 0,59\* | 0,28\* | 0,17\* | - |  |  |  |  |  |  |  |  |  |  |  | d |
| 3,33 | 0,329 | a1b1 | 10,26 | 0,59\* | 0,28\* | 0,17\* | 0,00tn | - |  |  |  |  |  |  |  |  |  |  | d |
| 3,37 | 0,333 | a2b3 | 10,54 | 0,87\* | 0,56\* | 0,46\* | 0,28tn | 0,28tn | - |  |  |  |  |  |  |  |  |  | de |
| 3,39 | 0,335 | a1b2 | 10,67 | 1,00\* | 0,69\* | 0,59\* | 0,41\* | 0,41\* | 0,12tn | - |  |  |  |  |  |  |  |  | ef |
| 3,41 | 0,337 | a3b3 | 10,69 | 1,02\* | 0,71\* | 0,61\* | 0,43\* | 0,43\* | 0,15tn | 0,02tn | - |  |  |  |  |  |  |  | efg |
| 3,42 | 0,338 | a1b3 | 10,74 | 1,07\* | 0,76\* | 0,66\* | 0,48\* | 0,48\* | 0,20tn | 0,07tn | 0,05tn | - |  |  |  |  |  |  | efg |
| 3,44 | 0,34 | a1b4 | 10,92 | 1,25\* | 0,94\* | 0,84\* | 0,66\* | 0,66\* | 0,38\* | 0,25tn | 0,23tn | 0,17tn | - |  |  |  |  |  | fgh |
| 3,445 | 0,34 | a1b5 | 10,92 | 1,25\* | 0,94\* | 0,84\* | 0,66\* | 0,66\* | 0,38\* | 0,25tn | 0,23tn | 0,17tn | 0,00tn | - |  |  |  |  | fgh |
| 3,45 | 0,341 | a2b4 | 11 | 1,33\* | 1,0\* | 0,92\* | 0,74\* | 0,74\* | 0,46\* | 0,33\* | 0,30tn | 0,25tn | 0,07tn | 0,07tn | - |  |  |  | gh |
| 3,455 | 0,341 | a2b5 | 11,18 | 1,51\* | 1,20\* | 1,10\* | 0,92\* | 0,92\* | 0,61\* | 0,51\* | 0,48\* | 0,43\* | 0,25tn | 0,25tn | 0,17tn | - |  |  | hi |
| 3,46 | 0,342 | a3b5 | 11,36 | 1,69\* | 1,38\* | 1,28\* | 1,10\* | 1,10\* | 0,82\* | 0,69\* | 0,66\* | 0,61\* | 0,43\* | 0,43\* | 0,35\* | 0,17tn | - |  | ij |
| 3,46 | 0,342 | a3b4 | 11,51 | 1,84\* | 1,53\* | 1,43\* | 1,20\* | 1,25\* | 0,97\* | 0,84\* | 0,82\* | 0,76\* | 0,59\* | 0,59\* | 0,51\* | 0,33\* | 0,15tn | - | j |

Tabel dua arah (Two Way) untuk A sama B yang berbeda

Interaksi a1 terhadap b

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 | | 4 | | 5 |
| - | - | a1b1 | 10,26 | - |  | - |  | - |  |  |  |  | A |
| 3,03 | 0,2992 | a1b2 | 10,67 | 0,410 | \* | - |  | - |  |  |  |  | B |
| 3,18 | 0,3140 | a1b3 | 10,74 | 0,487 | \* | 0,077 | tn | - |  |  |  |  | B |
| 3,27 | 0,3229 | a1b4 | 10,92 | 0,667 | \* | 0,256 | tn | 0,179 | tn | - |  |  | B |
| 3,30 | 0,3259 | a1b5 | 10,92 | 0,667 | \* | 0,256 | tn | 0,179 | tn | 0,000 | tn | - | B |

Interaksi a2 terhadap b

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 | | 4 | | 5 |
| - | - | a1b2 | 9,66 | - |  | - |  | - |  |  |  |  | A |
| 3,03 | 0,2992 | a1b1 | 10,07 | 0,410 | \* | - |  | - |  |  |  |  | B |
| 3,18 | 0,3140 | a1b3 | 10,53 | 0,870 | \* | 0,460 | \* | - |  |  |  |  | C |
| 3,27 | 0,3229 | a1b4 | 11,00 | 1,340 | \* | 0,930 | \* | 0,470 | \* | - |  |  | D |
| 3,30 | 0,3259 | a1b5 | 11,17 | 1,510 | \* | 1,100 | \* | 0,640 | \* | 0,170 | tn | - | D |

Interaksi a3 terhadap b

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 | | 4 | | 5 |
| - | - | a3b1 | 9,97 | - |  | - |  | - |  |  |  |  | A |
| 3,03 | 0,2992 | a3b2 | 10,25 | 0,280 | tn | - |  | - |  |  |  |  | A |
| 3,18 | 0,3140 | a3b3 | 10,69 | 0,720 | \* | 0,440 | \* | - |  |  |  |  | B |
| 3,27 | 0,3229 | a3b5 | 11,35 | 1,380 | \* | 1,100 | \* | 0,660 | \* | - |  |  | C |
| 3,30 | 0,3259 | a3b4 | 11,51 | 1,540 | \* | 1,260 | \* | 0,820 | \* | 0,160 | \* | - | D |

Tabel dua arah (Two Way) untuk B sama A yang berbeda

Interaksi b1 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a3b1 | 9,97 | - |  | - |  | - | A |
| 3,03 | 0,2992 | a2b1 | 10,08 | 0,110 | tn | - |  | - | A |
| 3,18 | 0,3140 | a1b1 | 10,26 | 0,290 | tn | 0,180 | tn | - | A |

Interaksi b2 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a2b2 | 9,67 | - |  | - |  | - | A |
| 3,03 | 0,2992 | a3b2 | 10,3 | 0,590 | \* | - |  | - | B |
| 3,18 | 0,3140 | a1b2 | 10,7 | 1,000 | \* | 0,410 | \* | - | C |

Interaksi b3 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a2b3 | 10,5 | - |  | - |  | - | A |
| 3,03 | 0,2992 | a3b3 | 10,7 | 0,160 | tn | - |  | - | A |
| 3,18 | 0,3140 | a1b3 | 10,7 | 0,210 | tn | 0,050 | tn | - | A |

Interaksi b4 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a1b4 | 10,92 | - |  | - |  | - | A |
| 3,03 | 0,2992 | a2b4 | 11,00 | 0,080 | tn | - |  | - | A |
| 3,18 | 0,3140 | a3b4 | 11,51 | 0,590 | \* | 0,510 | \* | - | B |

Interaksi b5 terhadap a

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SSR 5% | LSR 5% | Rata-rata perlakuan | | Perlakuan | | | | | Taraf Nyata 5% |
| 1 | | 2 | | 3 |
| - | - | a1b5 | 10,92 | - |  | - |  | - | A |
| 3,03 | 0,2992 | a2b5 | 11,18 | 0,260 | tn | - |  | - | A |
| 3,18 | 0,3140 | a3b5 | 11,35 | 0,170 | tn | 0,170 | tn | - | A |

**Tabel Waktu Pengukusan dan Perbandingan Jumlah Tepung Komposit Terhadap Kadar Protein**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Waktu Pengukusan | Jumlah Perbandingan Tepung Komposit | | | | |
| b1 (10;0;0) | b2(8;1;1) | b3(6;2;2) | b4(4;3;3) | b5(2;4;4) |
| a1 (t = 5) | A | C | A | A | A |
| 10,26 | 10,67 | 10,74 | 10,92 | 10,92 |
| a | b | b | b | B |
| a2 (t = 10) | A | A | A | A | A |
| 10,08 | 9,67 | 10,54 | 11,00 | 11,18 |
| b | a | c | d | E |
| a3 (t = 15) | A | B | A | B | A |
| 9,97 | 10,26 | 10,69 | 11,51 | 11,36 |
| a | a | b | d | C |

**Lampiran 12 : Data Analisis Respon Fisik Penelitian Utama**

**Data Hasil Analisis Tekstur Makaroni Dengan Penemometer**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Kode Sampel** | | **Pengukuran (mm/10detik/g)** | | | | | | | | | | **Rata- rata (mm/det/g)** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| 623 | **a1b1** | 4 | 3 | 1 | 2 | 4 | 3 | 2 | 4 | 2 | 3 | **2,80** |
| 410 | **a1b2** | 2 | 5 | 3 | 3 | 2 | 1 | 4 | 3 | 2 | 2 | **2,70** |
| 133 | **a1b3** | 5 | 5 | 7 | 3 | 4 | 7 | 1 | 4 | 3 | 5 | **4,40** |
| 508 | **a1b4** | 5 | 3 | 2 | 8 | 6 | 3 | 2 | 2 | 3 | 5 | **3,90** |
| 764 | **a1b5** | 6 | 3 | 4 | 5 | 4 | 2 | 6 | 3 | 2 | 2 | **3,70** |
| 741 | **a2b1** | 3 | 2 | 3 | 1 | 2 | 4 | 3 | 3 | 4 | 2 | **2,70** |
| 056 | **a2b2** | 2 | 3 | 2 | 1 | 4 | 2 | 3 | 5 | 2 | 1 | **2,50** |
| 510 | **a2b3** | 3 | 3 | 4 | 3 | 5 | 4 | 5 | 3 | 2 | 1 | **3,30** |
| 197 | **a2b4** | 2 | 1 | 3 | 4 | 2 | 3 | 5 | 3 | 2 | 4 | **2,90** |
| 165 | **a2b5** | 5 | 5 | 4 | 4 | 5 | 2 | 3 | 4 | 4 | 3 | **3,90** |
| 634 | **a3b1** | 2 | 3 | 2 | 2 | 3 | 7 | 6 | 4 | 2 | 4 | **3,50** |
| 423 | **a3b2** | 1 | 4 | 6 | 4 | 3 | 2 | 2 | 3 | 4 | 3 | **3,20** |
| 456 | **a3b3** | 6 | 5 | 3 | 5 | 7 | 4 | 3 | 2 | 6 | 5 | **4,60** |
| 149 | **a3b4** | 4 | 3 | 6 | 2 | 8 | 6 | 5 | 3 | 3 | 2 | **4,20** |
| 067 | **a3b5** | 4 | 3 | 3 | 5 | 2 | 1 | 4 | 3 | 2 | 2 | **2,90** |
| 163 | **a1b1** | 3 | 3 | 4 | 2 | 5 | 1 | 6 | 2 | 2 | 4 | **3,20** |
| 232 | **a1b2** | 2 | 2 | 3 | 2 | 7 | 4 | 3 | 5 | 3 | 2 | **3,30** |
| 405 | **a1b3** | 2 | 5 | 5 | 3 | 4 | 2 | 2 | 4 | 3 | 4 | **3,40** |
| 424 | **a1b4** | 2 | 5 | 4 | 4 | 1 | 2 | 1 | 4 | 2 | 4 | **2,90** |
| 247 | **a1b5** | 2 | 1 | 3 | 3 | 1 | 5 | 2 | 5 | 3 | 3 | **2,80** |
| 057 | **a2b1** | 2 | 6 | 5 | 2 | 2 | 5 | 4 | 2 | 3 | 2 | **3,30** |
| 568 | **a2b2** | 4 | 2 | 4 | 5 | 2 | 4 | 2 | 6 | 2 | 6 | **3,70** |
| 055 | **a2b3** | 2 | 4 | 6 | 2 | 4 | 3 | 4 | 5 | 3 | 2 | **3,50** |
| 307 | **a2b4** | 4 | 6 | 3 | 3 | 5 | 4 | 2 | 4 | 2 | 3 | **3,60** |
| 547 | **a2b5** | 2 | 4 | 3 | 4 | 2 | 3 | 2 | 3 | 4 | 5 | **3,20** |
| 316 | **a3b1** | 4 | 4 | 3 | 5 | 3 | 3 | 2 | 3 | 5 | 3 | **3,50** |
| 128 | **a3b2** | 3 | 3 | 6 | 5 | 6 | 4 | 3 | 6 | 3 | 4 | **4,30** |
| 107 | **a3b3** | 2 | 2 | 5 | 3 | 2 | 5 | 5 | 3 | 5 | 3 | **3,50** |
| 611 | **a3b4** | 2 | 4 | 4 | 3 | 3 | 3 | 5 | 3 | 3 | 5 | **3,50** |
| 570 | **a3b5** | 5 | 3 | 2 | 2 | 4 | 2 | 2 | 5 | 3 | 5 | **3,30** |

**Data Hasil Analisis Tekstur Makaroni Dengan Penemometer**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Waktu Pengukusan (A)** | **Perbandingan Jumlah Tepung Komposit (B)** | **Kelompok Ulangan** | | **Total** | **Rata –rata** |
| **1** | **2** |
| **a1 = 5 menit** | **b1 (10:0:0)** | 2,80 | 3,20 | 6,00 | 3,00 |
| **b2 (8:1:1)** | 3,80 | 3,30 | 7,10 | 3,55 |
| **b3 (6:2:2)** | 4,40 | 3,40 | 7,80 | 3,90 |
| **b4 (4:3:3)** | 3,90 | 2,90 | 6,80 | 3,40 |
| **b5 (2:4:4)** | 3,70 | 2,80 | 6,50 | 3,25 |
| **Sub Total** | | 18,60 | 15,60 | 34,20 | 17,10 |
| **Rata-Rata** | | 3,72 | 3,12 | 6,84 | 3,42 |
| **a2 = 10 menit** | **b1 (10:0:0)** | 2,70 | 3,30 | 6,00 | 3,00 |
| **b2 (8:1:1)** | 2,50 | 3,70 | 6,20 | 3,10 |
| **b3 (6:2:2)** | 3,30 | 3,50 | 6,80 | 3,40 |
| **b4 (4:3:3)** | 2,90 | 3,60 | 6,50 | 3,25 |
| **b5 (2:4:4)** | 3,90 | 3,20 | 7,10 | 3,55 |
| **Sub Total** | | 15,30 | 17,30 | 32,60 | 16,30 |
| **Rata-Rata** | | 3,06 | 3,46 | 6,52 | 3,26 |
| **a3 = 15 menit** | **b1 (10:0:0)** | 3,50 | 3,50 | 7,00 | 3,50 |
| **b2 (8:1:1)** | 3,20 | 4,30 | 7,50 | 3,75 |
| **b3 (6:2:2)** | 4,60 | 3,50 | 8,10 | 4,05 |
| **b4 (4:3:3)** | 4,20 | 3,50 | 7,70 | 3,85 |
| **b5 (2:4:4)** | 2,90 | 3,30 | 6,20 | 3,10 |
| **Sub Total** | | 18,40 | 18,10 | 36,50 | 18,25 |
| **Rata-rata** | | 3,68 | 3,62 | 7,30 | 3,65 |
| **Total** | | 52,30 | 51,00 | 103,30 | 51,65 |
| **Rata-rata** | | 19,69 | 19,19 | 38,89 | 19,44 |

**Perhitungan Anava**

Faktor Koreksi (FK) = (Total)2

r x b x a

= (103,30)2

2 x 5 x 3

= 355,6963

JK Kelompok (JKK) = – FK

= – 355,6963

= 0,0563

JK Total (JKT) = [(a1b1)2 +... + (a3b3)2] - FK

= [(2,8)2 + ... + (3,3)2] – 355,6963

= 7,6937

JK(a) = - FK

= – 355,6963

= 0,7687

JK(b) = – FK

= – 355,6963

= 1,2987

JK(ab) = – FK – JKa - JKb

= – 355,6963 – 0,7687 – 1,2987 = 1,0713

JKG = JKT – JKK- JK(a) – JK(b) – JK (ab)

= 7,6937 – 0,0563 – 0,7687 – 1,2987 – 1,0713

= 4,4987

**Hasil Analisis Variasi (ANAVA )**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variansi** | **db** | **JK** | **KT** | **F Hitung** | | **F Tabel** |
| **Kelompok** | 1 | 0,0563 | 0,0563 | - | | - |
| **A** | 2 | 0,7687 | 0,3843 | 1,20 | **tn** | 2,73 |
| **B** | 4 | 1,2987 | 0,3247 | 1,01 | **tn** | 3,11 |
| **AB** | 8 | 1,0713 | 0,1339 | 0,42 | **tn** | 2,70 |
| **Galat** | 14 | 4,4987 | 0,3213 | \ |  |  |
| **Total** | 29 | 7,6937 |  |  |  |  |

Keterangan :tn = tidak berpegaruh nyata

Kesimpulan :

Berdasarkan tabel ANAVA diketahui bahwa Fhitung ≥ Ftabel pada taraf 5% maka dapat disimpulkan bahwa waktu pengukusan (A), perbandingan jumlah tepung komposit (B) dan interaksi antara waktu pengukusan dan perbandingan jumlah tepung komposit (AB) tidak berpengaruh nyata terhadap tekstur kekerasan makaroni, sehingga tidak perlu dilakukan uji lanjut.

**Lampiran 12. Produk Terpilih Pada Penelitian Utama**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sampel** | **Uji Organoleptik** | | | | | | | | | |  | **Uji Kimia** | | | | | | **Uji Fisik** | |
| **Warna** | | **Bentuk** | | **Tekstur** | | **Aroma** | | **Rasa** | |  | **Kadar Karbohidrat** | | **Kadar Protein** | | **Kadar Air** | | **Kekerasan** | |
| **Rata-rata** | **Taraf nyata** | **Rata-rata** | **Taraf nyata** | **Rata-rata** | **Taraf nyata** | **Rata-rata** | **Taraf nyata** | **Rata-rata** | **Taraf nyata** | **Sub Rata-rata** | **Rata-rata** | **Taraf nyata** | **Rata-rata** | **Taraf nyata** | **Rata-rata** | **Taraf nyata** | **Rata-rata** | **Taraf nyata** |
| a1b1 | 2,85 | b | 2,57 | abc | 3,35 | ab | 3,90 | - | 3,90 | ef | 3,31 | 76,19 | - | 20,52 | d | 10,45 | cde | 3,00 | - |
| a1b2 | 3,12 | cd | 2,70 | bcd | 3,23 | a | 3,58 | - | 4,00 | f | 3,33 | 78,55 | - | 21,34 | ef | 10,79 | de | 3,55 | - |
| a1b3 | 3,75 | d | 3,82 | f | 3,33 | ab | 3,52 | - | 3,48 | cd | 3,58 | 79,44 | - | 21,49 | efg | 10,29 | bcd | 3,90 | - |
| **a1b4** | **4,50** | **fg** | **4,60** | **i** | **3,72** | **ef** | **3,77** | **-** | **3,55** | **d** | **4,03** | **81,29** | **-** | **21,85** | **fgh** | **10,09** | **bcd** | **3,40** | **-** |
| a1b5 | 4,62 | g | 4,55 | hi | 3,55 | cde | 3,52 | - | 3,23 | b | 3,89 | 81,19 | - | 21,85 | fgh | 8,61 | a | 3,25 | - |
| a2b1 | 2,60 | a | 2,75 | cd | 3,33 | ab | 3,75 | - | 3,77 | e | 3,24 | 76,03 | - | 20,16 | c | 11,76 | f | 3,00 | - |
| a2b2 | 2,82 | b | 2,85 | d | 3,63 | def | 3,73 | - | 3,75 | e | 3,36 | 77,53 | - | 19,34 | a | 10,63 | de | 3,10 | - |
| a2b3 | 4,12 | ef | 3,98 | fgh | 3,90 | gh | 3,60 | - | 3,50 | cd | 3,82 | 78,07 | - | 21,11 | de | 10,44 | bcde | 3,40 | - |
| a2b4 | 3,90 | e | 4,25 | gh | 3,40 | ab | 3,63 | - | 3,23 | b | 3,68 | 80,90 | - | 22,00 | gh | 10,15 | bcd | 3,25 | - |
| a2b5 | 4,52 | fg | 4,38 | h | 3,50 | bcd | 3,37 | - | 2,83 | a | 3,72 | 78,88 | - | 22,36 | hi | 9,57 | ab | 3de,55 | - |
| a3b1 | 2,42 | a | 2,40 | a | 3,48 | bcd | 3,65 | - | 3,75 | e | 3,14 | 73,00 | - | 19,95 | b | 12,96 | g | 3,50 | - |
| a3b2 | 2,33 | a | 2,42 | b | 3,42 | bc | 3,55 | - | 3,33 | bc | 3,01 | 74,04 | - | 20,51 | d | 11,21 | ef | 3,75 | - |
| a3b3 | 4,22 | ef | 4,13 | fgh | 3,42 | bc | 3,48 | - | 3,18 | b | 3,69 | 75,36 | - | 21,39 | efg | 10,73 | de | 4,05 | - |
| a3b4 | 3,33 | c | 3,30 | e | 3,98 | h | 3,63 | - | 3,55 | d | 3,56 | 80,72 | - | 22,00 | j | 9,57 | abc | 3,85 | - |
| a3b5 | 4,05 | e | 3,85 | fg | 3,75 | fg | 3,50 | - | 3,20 | b | 3,67 | 75,97 | - | 22,72 | ij | 9,09 | a | 3,10 | - |

Kesimpulan :

Berdasarkan hasil penelitian utama berdasarkan respon organoleptik,kimia dan fisik terhadap produk makaroni cassava koro dapat disimpulkan bahwa perlakuan yang terbaik adalah perlakuan a1b5 yaitu waktu pengukusan 5 menit dan perbandingan jumlah tepung komposit 2 bagian tepung terigu : 4 bagian tepung singkong ; 4 bagian tepung kacang koro (2 : 4 : 4).