7. APPENDICES

Appendix 1. Focus Group Discussion (FGD) results

FGD findings and interpretations

Key Question	Finding	Interpretation
What kind of texture characteristics do you want for a beef sausage?	Elastic	Elastic is a popular term of elasticity / springiness. Springiness is the ratio of sample height recoverable after given pushing force
	Tender but still require some effort to chew	Tenderness is a popular term of hardness. Hardness is the amount of energy required to push of bite food material until it break
	Compact, will not be easily crumble	Compactness is a popular term of cohesiveness. Cohesiveness is binding force between food material's particles
	Soft, smooth, not coarse, less fibrous feel	Soft smooth is the popular term of coarseness. Coarseness is the condition where a food product is felt to be coarse on tongue
	Require some chews before swallow	Ability to be chewed before swallow describes the term: chewiness. Chewiness is the time required to chew food or number of chews needed before swallowing process
	Not sticky in mouth	Stickiness is a popular term of adhesiveness. Adhesiveness is the amount of energy needed to remove food that stick on mouth cavity or of teeth
	Not too mushy	Mushy is a popular term of moisture content or juiciness. Juiciness is the amount of water contained in the material
What are the textures attributes that you consider important?	Elastic Tender Smooth Chewable Not mushy	

Appendix 2. Worksheet, Questionnaire and matching test results

WORKSHEET UJI KECOCOKAN

Uji : Uji kecocokan rasa dasar
Tanggal pengujian :

Rasa dasar

Jenis rasa dasar	Bahan	Konsentrasi (g/L)	Kode
Manis	Gula	20	A
Asin	Garam NaCl	2	B
Asam	Asam sitrat	0.5	C
Pahit	Kafein	0.5	D

Kode kombinasi urutan penyajian

1 = ABCD – BACD	6 = CABD – DABC
2 = ACBD – BADC	7 = CADB – DACB
3 = ABDC – BCAD	8 = CBAD – DBAC
4 = ADBC – BCDA	9 = CBDA – DBCA
5 = ACDB – BDCA	10 = CDAB - DCAB

Penyajian

Panelis	Urutan penyajian	Kode sampel[a] – kode sampel[b]
1, 11	1	862 245 458 396 – 522 489 298 665
2, 12	2	635 665 113 917 – 365 332 896 314
3, 13	3	688 486 663 712 – 585 351 847 295
4, 14	4	797 949 368 478 – 636 746 222 537
5, 15	5	691 542 355 581 – 252 593 743 163
6, 16	6	369 138 765 183 – 398 223 756 544
7, 17	7	537 522 459 984 – 585 946 127 711
8, 18	8	549 445 793 734 – 855 121 885 595
9, 19	9	152 237 574 611 – 145 784 363 463
10, 20	10	136 155 159 397 – 873 646 912 714

Rekap kode sampel

Sampel A	a	862 635 688 797 691 138 522 793 611 159
	b	489 332 847 537 163 223 946 885 463 912
Sampel B	a	245 113 486 368 581 765 984 445 237 397
	b	522 365 585 636 252 756 711 121 784 714
Sampel C	a	458 665 712 478 542 369 537 549 152 136
	b	298 314 351 746 743 544 127 595 363 646
Sampel D	a	396 917 663 949 355 183 459 734 574 155
	b	665 896 295 222 593 398 585 855 145 873

Uji Kecocokan

(Identifikasi Rasa Dasar)

Nama :

Tanggal pengujian :

Sampel : Larutan rasa dasar

Kriteria : Rasa

Instruksi :

Lakukan pencicipan sampel larutan yang ada di sebelah kanan Anda. Setelah mencicipi satu sampel, lakukan pembilasan lidah dengan meminum air tawar dan jeda waktu selama 30 detik, untuk kemudian berpindah pada sampel berikutnya. Pasangkan dengan tepat rasa yang Anda cicip pada sampel laruta di sebelah kanan dengan salah satu larutan yang ada di sebelah kiri Anda dan identifikasi rasa yang Anda cicipi.

Kode sampel sebelah **Kanan**	Kode sampel sebeleh **Kiri**	Identifikasi Rasa

Matching test results

No.	Name	% Correct answers (%)	Pass/ fail
1	Margaretha B.P.	100	Pass
2	Levina	100	Pass
3	Angeliga W.	100	Pass
4	Tania S,	75	Pass
5	Bayu	100	Pass
6	Ratna	100	Pass
7	Devi A.	75	Pass
8	Trias	75	Pass
9	Andi	100	Pass
10	Sugiharto	75	Pass
11	Tika	75	Pass
12	Melia	100	Pass
13	Francesco	100	Pass
14	Donna	100	Pass
15	Christian H.	100	Pass
16	Eveline H.	100	Pass
17	Ayu	75	Pass
18	Desi Triana	100	Pass
19	Sandi A,	100	Pass
20	Ronald G.	100	Pass
21	Panji	100	Pass
22	Ricky	100	Pass
23	Budiarsih	100	Pass
24	Leo	50	Fail
25	Y. Hans A.	50	Fail
26	Rosalia Devi	25	Fail
27	Ivanna H.	50	Fail
28	Yanie	50	Fail

Appendix 3. Worksheet, questionnaire and Triangle test results

WORKSHEET UJI SEGITIGA

Tanggal :

Jenis sampel : sosis ayam (goreng)

Identifikasi sampel

Jenis sampel	Kode
Sosis ayam merk Vida	P
Sosis ayam merk Vigo	F

Penyajian

Panelis	Sampel
1, 11	P 771 F 183 F 834
2, 12	F 399 P 257 F 618
3, 13	F 965 F 546 P 244
4, 14	F 653 P 787 P 111
5, 15	P 168 F 935 P 572
6, 16	P 319 F 421 F 988
7, 17	F 231 P 596 F 847
8, 18	F 353 F 112 P 775
9, 19	F 847 P 431 P 958
10, 20	P 282 F 316 P 747

Rekap kode sampel

Sampel P	771 257 244 787 111 168 572 319 596 775 431 958 282 747
Sampel F	183 834 399 618 965 546 653 935 421 988 231 847 353 112 874 316

UJI SEGITIGA

Nama :

Tanggal :

Produk : Sosis ayam (goreng)

Instruksi :

Dihadapan Anda terdapat 3 set sampel, dimana setiap set terdiri dari tiga sampel yang terdiri dari dua sampel yang sama dan satu sampel beda. Setelah mencicipi satu sampel, lakukan pembilasan lidah dengan meminum air tawar dan jeda waktu selama 30 detik, untuk kemudian berpindah pada sempel berikutnya. Cicipi sampel secara berurut dari kiri ke kanan. Pencicipan hanya diperbolehkan satu kali dan tidak diperkenankan mengulang pencicipan. Identifikasi sampel mana yang berbeda dengan menuliskan kode sampel yang beda pada kolom dibawah ini :

Set	Kode sampel			Kode sampel yang beda
1				
2				
3				

Triangle test results

No.	Name	% Correct answers	Pass/ fail
1	Margaretha B.P.	100	Pass
2	Levina	100	Pass
3	Angeliga W.	100	Pass
4	Tania S,	100	Pass
5	Bayu	66,67	Pass
6	Ratna	100	Pass
7	Devi A.	100	Pass
8	Trias	66,67	Pass
9	Andi	66,67	Pass
10	Sugiharto	66,67	Pass
11	Tika	66,67	Pass
12	Melia	100	Pass
13	Francesco	100	Pass
14	Donna	100	Pass
15	Christian H.	100	Pass
16	Eveline H.	66,67	Pass
17	Ayu	100	Pass
18	Desi Triana	100	Pass
19	Sandi A,	33,33	Fail
20	Ronald G.	33,33	Fail
21	Panji	0	Fail
22	Ricky	0	Fail
23	Budiarsih	33,33	Fail

Appendice 4. Worksheet, questionnaire and Ranking test results

WORKSHEET UJI RANKING

Tanggal :

Jenis uji : Kekerasan (hardness) sosis ayam

Identifikasi sampel

Jenis sampel	Kode
Sosis ayam merk Vigo	A
Sosis ayam merk Villa	B
Sosis ayam merk Bernardi	C
Sosis ayam merk Vida	D

Kode kombinasi urutan penyajian

1 = ABCD	6 = CABD
2 = ACBD	7 = CADB
3 = ABDC	8 = CBAD
4 = ADBC	9 = CBDA
5 = ACDB	10 = CDAB

Penyajian

Panelis	Urutan penyajian	Kode sampel
1, 11	1	862 245 458 396
2, 12	2	635 665 113 917
3, 13	3	688 486 663 712
4, 14	4	797 949 368 478
5, 15	5	691 542 355 581
6, 16	6	369 138 765 183
7, 17	7	537 522 459 984
8, 18	8	549 445 793 734
9, 19	9	152 237 574 611
10, 20	10	136 155 159 397

Rekap kode sampel

Sampel A	862 635 688 797 691 138 522 793 611 159
Sampel B	245 113 486 368 581 765 984 445 237 397
Sampel C	458 665 712 478 542 369 537 549 152 136
Sampel D	396 917 663 949 355 183 459 734 574 155

UJI RANKING

Nama :

Tanggal :

Produk : Sosis ayam (goreng)

Kriteria : Kekerasan (hardness) sosis ayam

Instruksi :

Lakukan pengujian terhadap **tingkat kekerasan** sampel dengan mencicipi sampel, mulai dari yang paling kiri ke kanan. Sampel dicicip dengan cara meletakkan sosis diantara gigi geraham, kemudian gigit sekali dan rasakan tingkat kekerasannya. Setelah mencicipi satu sampel, lakukan pembilasan lidah dengan meminum air tawar dan jeda waktu selama 30 detik, untuk kemudian berpindah pada sempel berikutnya. **Bandingkan tingkat kekerasan** sampel sosis ayam dan ranking kekerasan sampel tersebut (**ranking tidak boleh sama**), dengan mengisikan kode sampel sesuai dengan tingkat kekerasannya pada kolom di bawah ini:

Tingkat kekerasan	Kode sampel
Paling lunak (tidak keras)	
Paling keras	

Ranking test results

No.	Name	% Correct answers	Pass/ fail
1	Margaretha B.P.	100	Pass
2	Levina	100	Pass
3	Angeliga W.	100	Pass
4	Tania S,	50 (few answers switched)	Pass
5	Bayu	100	Pass
6	Ratna	50 (few answers switched)	Pass
7	Devi A	100	Pass
8	Trias	50 (few answers switched)	Pass
9	Andi	100	Pass
10	Sugiharto	100	Pass
11	Tika	100	Pass
12	Melia	100	Pass
13	Francesco	100	Pass
14	Donna	50 (few answers switched)	Pass
15	Christian H.	50 (few answers switched)	Pass
16	Eveline H.	50 (few answers switched)	Pass
17	Ayu	25	Fail
18	Desi Triana	0	Fail

Appendice 5. Worksheet, questionnaire and Rating intensity test

WORKSHEET UJI RATING INTENSITAS

Tanggal pengujian :
Jenis sampel : Sosis sapi (goreng)

Identifikasi sampel

Jenis sampel	Kode
Sosis sapi merk Bernardi	A
Sosis sapi merk Farm House	B
Sosis sapi merk Villa	C
Sosis sapi merk Vida	D
Sosis sapi merk Vigo	E
Sosis sapi merk Fino	F

Kode kombinasi urutan penyajian

1 = ABCDFE	6 = CABDEF
2 = ACBDFE	7 = CADBEF
3 = ABDCFE	8 = CBADFE
4 = ADBCFE	9 = CBDAFE
5 = ACDBFE	10 = CDABEF

Penyajian

Panelis	Urutan penyajian	Kode sampel
1, 11	1	862 245 458 396 522 489
2, 12	2	635 665 113 917 365 332
3, 13	3	688 486 663 712 585 847
4, 14	4	797 949 368 478 636 537
5, 15	5	691 542 355 581 252 163
6, 16	6	369 138 765 183 223 756
7, 17	7	537 522 459 984 946 711
8, 18	8	549 445 793 734 121 885
9, 19	9	152 237 574 611 784 463
10, 20	10	136 155 159 397 912 714

Rekap kode sampel

Sampel A	862 635 688 797 691 138 522 793 611 159
Sampel B	245 113 486 368 581 765 984 445 237 397
Sampel C	458 665 712 478 542 369 537 549 152 136
Sampel D	396 917 663 949 355 183 459 734 574 155
Sampel E	489 332 847 537 163 223 946 885 463 912
Sampel F	522 365 585 636 252 756 711 121 784 714

UJI RATING INTENSITAS

Nama :

Tanggal :

Produk : Sosis sapi (goreng)

Kriteria : Kekerasan (hardness) sapi sapi

Instruksi :

Dihadapan Anda terdapat enam sampel sapi sapi (goreng). Lakukan pengujian terhadap **tingkat kekerasan** sampel dengan cara meletakkan sosis diantara gigi geraham, kemudian gigit sekali dan rasakan tingkat kekerasannya. Setelah itu, berikan penilaian Anda dengan memberikan tanda √ pada kotak dibawah kode sampel. **Jangan membandingkan antar sampel**.

Penilaian	Kode Sampel						
Sangat lunak							
Lunak							
Tidak lunak/ tidak keras							
Keras							
Sangat keras							

UJI RATING INTENSITAS

Nama :

Tanggal :

Produk : Sosis sapi (goreng)

Kriteria : Chewiness sosis sapi

Instruksi :

Dihadapan Anda terdapat enam sampel sosis sapi (goreng). Lakukan pengujian terhadap **chewiness** sampel dengan cara menggigit dan mengunyah sampel sehingga sampel dapat ditelan, sambil menghitung jumlah kunyahan yang dibutuhkan. Setelah itu, berikan penilaian Anda dengan memberikan tanda √ pada kotak dibawah kode sampel. **Jangan membandingkan antar sampel**.

Penilaian (jumlah kunyahan)	Kode Sampel						
Sangat sedikit							
Sedikit							
Tidak banyak/ tidak sedikit							
Banyak							
Sangat banyak							

UJI RATING INTENSITAS

Nama :

Tanggal :

Produk : Sosis sapi (goreng)

Kriteria : Springiness sosis sapi

Instruksi :

Dihadapan Anda terdapat enam sampel sosis sapi (goreng). Lakukan pengujian terhadap **springiness** sampel dengan cara meletakkan sosis diantara gigi seri, kemudian gigit lalu lepaskan, dan rasakan apakah sampel dapat kembali ke bentuk semula.Setelah itu, berikan penilaian Anda dengan memberikan tanda √ pada kotak dibawah kode sampel. **Jangan membandingkan antar sampel**.

Penilaian	Kode Sampel					
Sangat tidak elastis						
Tidak elastis						
Tidak terlalu elastis						
Elastis						
Sangat elastis						

UJI RATING INTENSITAS

Nama :

Tanggal :

Produk : Sosis sapi (goreng)

Kriteria : Juicines sosis sapi

Instruksi :

Dihadapan Anda terdapat enam sampel sosis sapi (goreng). Lakukan pengujian terhadap **juiciness** sampel dengan cara mengunyah sosis dan merasakan jumlah air yang keluar dari sampel saat proses penguyahan tersebut. Setelah itu, berikan penilaian Anda dengan memberikan tanda √ pada kotak dibawah kode sampel. **Jangan membandingkan antar sampel**.

Penilaian	Kode Sampel						
Sangat tidak berair							
Tidak berair							
Sedikit berair							
Berair							
Sangat berair							

UJI RATING INTENSITAS

Nama :

Tanggal :

Produk : Sosis sapi (goreng)

Kriteria : Coarseness sosis sapi

Instruksi :

Dihadapan Anda terdapat tujuh sampel sosis sapi (goreng). Lakukan pengujian terhadap **tingkat kekasaran partikel** sampel dengan cara mengunyah sampel dan merasakan tingkat kekasaran partikel dampel tersebut. Setelah itu, berikan penilaian Anda dengan memberikan tanda √ pada kotak dibawah kode sampel. **Jangan membandingkan antar sampel**.

Penilaian	Kode Sampel						
Sangat halus							
Halus							
Tidak halus/ tidak kasar							
Kasar							
Sangat kasar							

Appendice 6. Worksheet, questionnaire and Hedonic ranking test

WORKSHEET UJI RANKING HEDONIK

Tanggal pengujian :
Jenis sampel : Sosis sapi (goreng)

Identifikasi sampel

Jenis sampel	Kode
Sosis sapi merk Bernardi	A
Sosis sapi merk Farm House	B
Sosis sapi merk Villa	C
Sosis sapi merk Vida	D
Sosis sapi merk Vigo	E
Sosis sapi merk Fino	F

Kode kombinasi urutan penyajian

1 = ABCDFE	6 = CABDEF
2 = ACBDFE	7 = CADBEF
3 = ABDCFE	8 = CBADFE
4 = ADBCFE	9 = CBDAFE
5 = ACDBFE	10 = CDABEF

Penyajian

Panelis	Urutan penyajian	Kode sampel
1, 11	1	862 245 458 396 522 489
2, 12	2	635 665 113 917 365 332
3, 13	3	688 486 663 712 585 847
4, 14	4	797 949 368 478 636 537
5, 15	5	691 542 355 581 252 163
6, 16	6	369 138 765 183 223 756
7, 17	7	537 522 459 984 946 711
8, 18	8	549 445 793 734 121 885
9, 19	9	152 237 574 611 784 463
10, 20	10	136 155 159 397 912 714

Rekap kode sampel

Sampel A	862 635 688 797 691 138 522 793 611 159
Sampel B	245 113 486 368 581 765 984 445 237 397
Sampel C	458 665 712 478 542 369 537 549 152 136
Sampel D	396 917 663 949 355 183 459 734 574 155
Sampel E	489 332 847 537 163 223 946 885 463 912
Sampel F	522 365 585 636 252 756 711 121 784 714

UJI RANKING HEDONIK

Nama :

Tanggal :

Produk : Sosis sapi (goreng)

Kriteria : Kesukaan terhadap rasa sosis sapi

Instruksi :

Lakukan pengujian terhadap **rasa** sampel dengan mencicipi sampel, mulai dari yang paling kiri ke kanan. Setelah mencicipi satu sampel, lakukan pembilasan lidah dengan meminum air tawar dan jeda waktu selama 30 detik, untuk kemudian berpindah pada sempel berikutnya. **Bandingkan rasa** sampel sosis sapi dan **ranking kesukaan terhadap rasa** sampel tersebut (**ranking tidak boleh sama**), dengan mengisikan kode sampel sesuai dengan tingkat kesukaan Anda pada kolom dibawah ini :

Rasa	Kode sampel
Paling tidak disukai	
Paling disukai	

UJI RANKING HEDONIK

Nama :

Tanggal :

Produk : Sosis sapi (goreng)

Kriteria : Kesukaan terhadap warna sosis sapi sapi

Instruksi :

Lakukan pengujian terhadap **warna** sampel dengan memperhatikan warna sampel, mulai dari yang paling kiri ke kanan. **Bandingkan warna** sampel sosis sapi dan **ranking kesukaan terhadap warna** sampel tersebut (**ranking tidak boleh sama**), dengan mengisikan kode sampel sesuai dengan tingkat kesukaan Anda pada kolom dibawah ini :

Rasa	Kode sampel
Paling tidak disukai	
Paling disukai	

UJI RANKING HEDONIK

Nama :

Tanggal :

Produk : Sosis sapi (goreng)

Kriteria : Kesukaan terhadap tekstur sosis sapi

Instruksi :

Lakukan pengujian terhadap **tekstur** sampel dengan mencicipi sampel, mulai dari yang paling kiri ke kanan. Setelah mencicipi satu sampel, lakukan pembilasan lidah dengan meminum air tawar dan jeda waktu selama 30 detik, untuk kemudian berpindah pada sempel berikutnya. **Bandingkan tekstur** sampel sosis sapi dan **ranking kesukaan terhadap tekstur** sampel tersebut (**ranking tidak boleh sama**), dengan mengisikan kode sampel sesuai dengan tingkat kesukaan Anda pada kolom dibawah ini :

Tekstur	Kode sampel
Paling tidak disukai	
Paling disukai	

UJI RANKING HEDONIK

Nama :

Tanggal :

Produk : Sosis sapi (goreng)

Kriteria : Kesukaan terhadap keseluruhan (overall) sosis sapi

Instruksi :

Lakukan pengujian terhadap sampel dengan mengamati dan mencicipi sampel, mulai dari yang paling kiri ke kanan. Setelah mencicipi satu sampel, lakukan pembilasan lidah dengan meminum air tawar dan jeda waktu selama 30 detik, untuk kemudian berpindah pada sempel berikutnya. **Bandingkan** sampel sosis sapi dan **ranking kesukaan terhadap keseluruhan** sampel tersebut (**ranking tidak boleh sama**), dengan mengisikan kode sampel sesuai dengan tingkat kesukaan Anda pada kolom dibawah ini :

Overall	Kode sampel
Paling tidak disukai	
Paling disukai	

Appendix 7. Rating Test Sensory analysis results

Hardness	BERNARDI	FARM HOUSE	VILLA	VIDA	VIGO	FINO
Sangat lunak		1		4	1	6
Lunak	4	4	5	5	4	2
Tidak keras/lunak	3	5	3		4	1
Keras	2		2	1	1	1
Sangat keras	1					
Chewiness						
Sangat sedikit				2		5
Sedikit	1	2	3	3	4	1
Tidak banyak/tidak sedkit	4	3	3	5	3	3
Banyak	3	5	4		3	1
Sangat banyak	2					
Elasticity						
Sangat tidak elastis				1		3
Tidak elastis		1	4	4	3	2
Tidak terlalu elastis	4	2	2	3	4	3
Elastis	5	6	4		1	2
Sangat elastis	1	1		2	2	
Juicyness						
Sangat tidak berair	2	1	1		2	1
Tidak berair	3	2	5	3	3	4
Sedikit berair	5	5	4	5	3	3
Berair		2		2	2	1
Sangat berair						1
Coarseness						
Sangat halus				2	1	5
Halus	8	5	1	5	5	3
Tidak halus/ tidak kasar	1	3	7	2	4	1
Kasar	1	2	2	1		1
Sangat kasar						

Appendix 8. Ranking test Sensory analysis results

Color	BERNARDI	FARM HOUSE	VILLA	VIDA	VIGO	FINO
1	3	0	9	2	5	12
2	2	5	4	5	9	6
3	4	2	3	13	5	4
4	6	6	5	6	4	4
5	7	7	7	2	6	2
6	9	11	3	3	2	3
n	31	31	31	31	31	31
value	132	141	99	103	96	80
Taste	0	0	5	8	0	18
	1	4	6	7	6	7
	1	2	9	7	9	3
	1	10	5	5	7	3
	5	11	6	3	6	0
	23	4	0	1	3	0
n	31	31	31	31	31	31
value	172	133	94	84	115	53
Texture	1	0	6	1	1	22
	1	2	3	13	9	3
	0	6	7	7	8	3
	2	7	10	6	6	0
	6	15	4	3	3	0
	21	1	1	1	4	3
n	31	31	31	31	31	31
value	167	131	99	93	106	55
Overall	0	0	4	6	2	19
	1	1	7	8	9	5
	1	2	8	8	9	4
	1	9	9	6	4	2
	4	16	3	2	4	1
	24	3	0	1	3	0
n	31	31	31	31	31	31
value	173	142	93	86	101	54

Appendix 9. Kruskal-Wallis Test (Beef sausage texture Batch 1)

Ranks

	BRAND	N	Mean Rank
HARD	vigo	30	16.90
	vida	30	92.33
	fino	30	83.53
	villa	30	158.57
	farmhouse	30	122.27
	bernardi	30	69.40
	Total	180	
SPRING	vigo	30	77.00
	vida	30	76.08
	fino	30	24.80
	villa	30	80.65
	farmhouse	30	131.68
	bernardi	30	152.78
	Total	180	
CHEW	vigo	30	49.30
	vida	30	80.33
	fino	30	27.88
	villa	30	139.07
	farmhouse	30	110.48
	bernardi	30	135.93
	Total	180	
HARD_FR	vigo	30	30.13
	vida	30	102.10
	fino	30	77.33
	villa	30	155.60
	farmhouse	30	46.37
	bernardi	30	131.47
	Total	180	
SPRNG_FR	vigo	30	24.20
	vida	30	53.27
	fino	30	82.33
	villa	30	110.67
	farmhouse	30	133.40
	bernardi	30	139.13
	Total	180	
CHEW_FR	vigo	30	22.00
	vida	30	87.70
	fino	30	67.70
	villa	30	142.57
	farmhouse	30	82.47
	bernardi	30	140.57
	Total	180	

Test Statistics(a,b)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Chi-Square	127.696	114.693	116.507	130.564	115.591	116.045
df	5	5	5	5	5	5
Asymp. Sig.	.000	.000	.000	.000	.000	.000

a Kruskal Wallis Test
b Grouping Variable: BRAND

Mann-Whitney Test (Beef sausage texture Batch 1)

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	vigo	30	15.60	468.00
	vida	30	45.40	1362.00
	Total	60		
SPRING	vigo	30	31.47	944.00
	vida	30	29.53	886.00
	Total	60		
CHEW	vigo	30	22.05	661.50
	vida	30	38.95	1168.50
	Total	60		
HARD_FR	vigo	30	16.80	504.00
	vida	30	44.20	1326.00
	Total	60		
SPRNG_FR	vigo	30	20.03	601.00
	vida	30	40.97	1229.00
	Total	60		
CHEW_FR	vigo	30	17.20	516.00
	vida	30	43.80	1314.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	3.000	421.000	196.500	39.000	136.000	51.000
Wilcoxon W	468.000	886.000	661.500	504.000	601.000	516.000
Z	-6.609	-.429	-3.748	-6.076	-4.642	-5.899
Asymp. Sig. (2-tailed)	.000	.668	.000	.000	.000	.000

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	vigo	30	15.50	465.00
	fino	30	45.50	1365.00
	Total	60		
SPRING	vigo	30	44.03	1321.00
	fino	30	16.97	509.00
	Total	60		
CHEW	vigo	30	38.55	1156.50
	fino	30	22.45	673.50
	Total	60		
HARD_FR	vigo	30	17.53	526.00
	fino	30	43.47	1304.00
	Total	60		
SPRNG_FR	vigo	30	16.30	489.00
	fino	30	44.70	1341.00
	Total	60		
CHEW_FR	vigo	30	17.07	512.00
	fino	30	43.93	1318.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	.000	44.000	208.500	61.000	24.000	47.000
Wilcoxon W	465.000	509.000	673.500	526.000	489.000	512.000
Z	-6.653	-6.003	-3.570	-5.751	-6.298	-5.958
Asymp. Sig. (2-tailed)	.000	.000	.000	.000	.000	.000

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	vigo	30	15.50	465.00
	villa	30	45.50	1365.00
	Total	60		
SPRING	vigo	30	28.48	854.50
	villa	30	32.52	975.50
	Total	60		
CHEW	vigo	30	15.70	471.00
	villa	30	45.30	1359.00
	Total	60		
HARD_FR	vigo	30	15.50	465.00
	villa	30	45.50	1365.00
	Total	60		
SPRNG_FR	vigo	30	18.80	564.00
	villa	30	42.20	1266.00
	Total	60		
CHEW_FR	vigo	30	16.33	490.00
	villa	30	44.67	1340.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	.000	389.500	6.000	.000	99.000	25.000
Wilcoxon W	465.000	854.500	471.000	465.000	564.000	490.000
Z	-6.653	-.895	-6.564	-6.653	-5.189	-6.283
Asymp. Sig. (2-tailed)	.000	.371	.000	.000	.000	.000

a Grouping Variable: BRAND]

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	vigo	30	15.80	474.00
	farmhouse	30	45.20	1356.00
	Total	60		
SPRING	vigo	30	18.43	553.00
	farmhouse	30	42.57	1277.00
	Total	60		
CHEW	vigo	30	18.37	551.00
	farmhouse	30	42.63	1279.00
	Total	60		
HARD_FR	vigo	30	26.80	804.00
	farmhouse	30	34.20	1026.00
	Total	60		
SPRNG_FR	vigo	30	15.57	467.00
	farmhouse	30	45.43	1363.00
	Total	60		
CHEW_FR	vigo	30	17.90	537.00
	farmhouse	30	43.10	1293.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	9.000	88.000	86.000	339.000	2.000	72.000
Wilcoxon W	474.000	553.000	551.000	804.000	467.000	537.000
Z	-6.520	-5.353	-5.382	-1.641	-6.623	-5.589
Asymp. Sig. (2-tailed)	.000	.000	.000	.101	.000	.000

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	vigo	30	16.50	495.00
	bernardi	30	44.50	1335.00
	Total	60		
SPRING	vigo	30	16.58	497.50
	bernardi	30	44.42	1332.50
	Total	60		
CHEW	vigo	30	16.63	499.00
	bernardi	30	44.37	1331.00
	Total	60		
HARD_FR	vigo	30	15.50	465.00
	bernardi	30	45.50	1365.00
	Total	60		
SPRNG_FR	vigo	30	15.50	465.00
	bernardi	30	45.50	1365.00
	Total	60		
CHEW_FR	vigo	30	15.50	465.00
	bernardi	30	45.50	1365.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	30.000	32.500	34.000	.000	.000	.000
Wilcoxon W	495.000	497.500	499.000	465.000	465.000	465.000
Z	-6.210	-6.174	-6.150	-6.653	-6.653	-6.653
Asymp. Sig. (2-tailed)	.000	.000	.000	.000	.000	.000

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	vida	30	32.87	986.00
	fino	30	28.13	844.00
	Total	60		
SPRING	vida	30	43.30	1299.00
	fino	30	17.70	531.00
	Total	60		
CHEW	vida	30	42.60	1278.00
	fino	30	18.40	552.00
	Total	60		
HARD_FR	vida	30	37.70	1131.00
	fino	30	23.30	699.00
	Total	60		
SPRNG_FR	vida	30	21.43	643.00
	fino	30	39.57	1187.00
	Total	60		
CHEW_FR	vida	30	36.03	1081.00
	fino	30	24.97	749.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	379.000	66.000	87.000	234.000	178.000	284.000
Wilcoxon W	844.000	531.000	552.000	699.000	643.000	749.000
Z	-1.050	-5.677	-5.367	-3.193	-4.021	-2.454
Asymp. Sig. (2-tailed)	.294	.000	.000	.001	.000	.014

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	vida	30	16.40	492.00
	villa	30	44.60	1338.00
	Total	60		
SPRING	vida	30	28.85	865.50
	villa	30	32.15	964.50
	Total	60		
CHEW	vida	30	18.13	544.00
	villa	30	42.87	1286.00
	Total	60		
HARD_FR	vida	30	17.60	528.00
	villa	30	43.40	1302.00
	Total	60		
SPRNG_FR	vida	30	20.53	616.00
	villa	30	40.47	1214.00
	Total	60		
CHEW_FR	vida	30	18.77	563.00
	villa	30	42.23	1267.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	27.000	400.500	79.000	63.000	151.000	98.000
Wilcoxon W	492.000	865.500	544.000	528.000	616.000	563.000
Z	-6.254	-.732	-5.485	-5.722	-4.421	-5.204
Asymp. Sig. (2-tailed)	.000	.464	.000	.000	.000	.000

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	vida	30	23.18	695.50
	farmhouse	30	37.82	1134.50
	Total	60		
SPRING	vida	30	19.55	586.50
	farmhouse	30	41.45	1243.50
	Total	60		
CHEW	vida	30	23.48	704.50
	farmhouse	30	37.52	1125.50
	Total	60		
HARD_FR	vida	30	41.70	1251.00
	farmhouse	30	19.30	579.00
	Total	60		
SPRNG_FR	vida	30	16.33	490.00
	farmhouse	30	44.67	1340.00
	Total	60		
CHEW_FR	vida	30	31.80	954.00
	farmhouse	30	29.20	876.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	230.500	121.500	239.500	114.000	25.000	411.000
Wilcoxon W	695.500	586.500	704.500	579.000	490.000	876.000
Z	-3.245	-4.857	-3.112	-4.968	-6.283	-.577
Asymp. Sig. (2-tailed)	.001	.000	.002	.000	.000	.564

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	vida	30	36.48	1094.50
	bernardi	30	24.52	735.50
	Total	60		
SPRING	vida	30	16.85	505.50
	bernardi	30	44.15	1324.50
	Total	60		
CHEW	vida	30	19.17	575.00
	bernardi	30	41.83	1255.00
	Total	60		
HARD_FR	vida	30	22.90	687.00
	bernardi	30	38.10	1143.00
	Total	60		
SPRNG_FR	vida	30	16.00	480.00
	bernardi	30	45.00	1350.00
	Total	60		
CHEW_FR	vida	30	19.30	579.00
	bernardi	30	41.70	1251.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	270.500	40.500	110.000	222.000	15.000	114.000
Wilcoxon W	735.500	505.500	575.000	687.000	480.000	579.000
Z	-2.654	-6.055	-5.027	-3.371	-6.431	-4.968
Asymp. Sig. (2-tailed)	.008	.000	.000	.001	.000	.000

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	fino	30	15.75	472.50
	villa	30	45.25	1357.50
	Total	60		
SPRING	fino	30	18.07	542.00
	villa	30	42.93	1288.00
	Total	60		
CHEW	fino	30	15.50	465.00
	villa	30	45.50	1365.00
	Total	60		
HARD_FR	fino	30	15.83	475.00
	villa	30	45.17	1355.00
	Total	60		
SPRNG_FR	fino	30	23.70	711.00
	villa	30	37.30	1119.00
	Total	60		
CHEW_FR	fino	30	17.63	529.00
	villa	30	43.37	1301.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	7.500	77.000	.000	10.000	246.000	64.000
Wilcoxon W	472.500	542.000	465.000	475.000	711.000	529.000
Z	-6.542	-5.515	-6.653	-6.505	-3.016	-5.707
Asymp. Sig. (2-tailed)	.000	.000	.000	.000	.003	.000

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	fino	30	21.02	630.50
	farmhouse	30	39.98	1199.50
	Total	60		
SPRING	fino	30	17.27	518.00
	farmhouse	30	43.73	1312.00
	Total	60		
CHEW	fino	30	17.10	513.00
	farmhouse	30	43.90	1317.00
	Total	60		
HARD_FR	fino	30	38.37	1151.00
	farmhouse	30	22.63	679.00
	Total	60		
SPRNG_FR	fino	30	18.77	563.00
	farmhouse	30	42.23	1267.00
	Total	60		
CHEW_FR	fino	30	26.20	786.00
	farmhouse	30	34.80	1044.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	165.500	53.000	48.000	214.000	98.000	321.000
Wilcoxon W	630.500	518.000	513.000	679.000	563.000	786.000
Z	-4.206	-5.870	-5.943	-3.489	-5.204	-1.907
Asymp. Sig. (2-tailed)	.000	.000	.000	.000	.000	.056

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	fino	30	35.13	1054.00
	bernardi	30	25.87	776.00
	Total	60		
SPRING	fino	30	16.80	504.00
	bernardi	30	44.20	1326.00
	Total	60		
CHEW	fino	30	16.43	493.00
	bernardi	30	44.57	1337.00
	Total	60		
HARD_FR	fino	30	18.37	551.00
	bernardi	30	42.63	1279.00
	Total	60		
SPRNG_FR	fino	30	17.60	528.00
	bernardi	30	43.40	1302.00
	Total	60		
CHEW_FR	fino	30	16.97	509.00
	bernardi	30	44.03	1321.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	311.000	39.000	28.000	86.000	63.000	44.000
Wilcoxon W	776.000	504.000	493.000	551.000	528.000	509.000
Z	-2.055	-6.077	-6.239	-5.382	-5.722	-6.002
Asymp. Sig. (2-tailed)	.040	.000	.000	.000	.000	.000

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	villa	30	40.28	1208.50
	farmhouse	30	20.72	621.50
	Total	60		
SPRING	villa	30	18.58	557.50
	farmhouse	30	42.42	1272.50
	Total	60		
CHEW	villa	30	37.03	1111.00
	farmhouse	30	23.97	719.00
	Total	60		
HARD_FR	villa	30	45.40	1362.00
	farmhouse	30	15.60	468.00
	Total	60		
SPRNG_FR	villa	30	27.10	813.00
	farmhouse	30	33.90	1017.00
	Total	60		
CHEW_FR	villa	30	42.50	1275.00
	farmhouse	30	18.50	555.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	156.500	92.500	254.000	3.000	348.000	90.000
Wilcoxon W	621.500	557.500	719.000	468.000	813.000	555.000
Z	-4.339	-5.287	-2.898	-6.609	-1.508	-5.322
Asymp. Sig. (2-tailed)	.000	.000	.004	.000	.132	.000

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	villa	30	44.93	1348.00
	bernardi	30	16.07	482.00
	Total	60		
SPRING	villa	30	16.47	494.00
	bernardi	30	44.53	1336.00
	Total	60		
CHEW	villa	30	30.37	911.00
	bernardi	30	30.63	919.00
	Total	60		
HARD_FR	villa	30	38.13	1144.00
	bernardi	30	22.87	686.00
	Total	60		
SPRNG_FR	villa	30	25.60	768.00
	bernardi	30	35.40	1062.00
	Total	60		
CHEW_FR	villa	30	31.80	954.00
	bernardi	30	29.20	876.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	17.000	29.000	446.000	221.000	303.000	411.000
Wilcoxon W	482.000	494.000	911.000	686.000	768.000	876.000
Z	-6.402	-6.225	-.059	-3.386	-2.173	-.577
Asymp. Sig. (2-tailed)	.000	.000	.953	.001	.030	.564

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	farmhouse	30	40.55	1216.50
	bernardi	30	20.45	613.50
	Total	60		
SPRING	farmhouse	30	23.52	705.50
	bernardi	30	37.48	1124.50
	Total	60		
CHEW	farmhouse	30	24.47	734.00
	bernardi	30	36.53	1096.00
	Total	60		
HARD_FR	farmhouse	30	16.63	499.00
	bernardi	30	44.37	1331.00
	Total	60		
SPRNG_FR	farmhouse	30	29.17	875.00
	bernardi	30	31.83	955.00
	Total	60		
CHEW_FR	farmhouse	30	18.87	566.00
	bernardi	30	42.13	1264.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	148.500	240.500	269.000	34.000	410.000	101.000
Wilcoxon W	613.500	705.500	734.000	499.000	875.000	566.000
Z	-4.458	-3.098	-2.676	-6.150	-.591	-5.160
Asymp. Sig. (2-tailed)	.000	.002	.007	.000	.554	.000

a Grouping Variable: BRAND

Appendix 10. Kruskal-Wallis Test (Beef sausage texture Batch 2)

Ranks

	BRAND	N	Mean Rank
HARD	vigo	30	90.18
	vida	30	54.68
	fino	30	41.20
	villa	30	130.98
	farmhouse	30	67.57
	bernardi	30	158.38
	Total	180	
SPRING	vigo	30	47.30
	vida	30	70.10
	fino	30	76.48
	villa	30	96.28
	farmhouse	30	101.28
	bernardi	30	151.55
	Total	180	
CHEW	vigo	30	44.93
	vida	30	68.27
	fino	30	76.65
	villa	30	119.03
	farmhouse	30	81.42
	bernardi	30	152.70
	Total	180	
HARD_FR	vigo	30	83.90
	vida	30	52.67
	fino	30	26.83
	villa	30	154.70
	farmhouse	30	85.20
	bernardi	30	139.70
	Total	180	
SPRNG_FR	vigo	30	49.83
	vida	30	45.17
	fino	30	65.87
	villa	30	88.50
	farmhouse	30	149.77
	bernardi	30	143.87
	Total	180	
CHEW_FR	vigo	30	72.77
	vida	30	40.03
	fino	30	37.20
	villa	30	137.83
	farmhouse	30	110.47
	bernardi	30	144.70
	Total	180	

Test Statistics(a,b)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Chi-Square	115.874	70.232	83.182	133.688	118.014	124.630
df	5	5	5	5	5	5
Asymp. Sig.	.000	.000	.000	.000	.000	.000

a Kruskal Wallis Test
b Grouping Variable: BRAND

Mann-Whitney Test (Beef sausage texture Batch 2)

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	vigo	30	39.38	1181.50
	vida	30	21.62	648.50
	Total	60		
SPRING	vigo	30	24.70	741.00
	vida	30	36.30	1089.00
	Total	60		
CHEW	vigo	30	24.65	739.50
	vida	30	36.35	1090.50
	Total	60		
HARD_FR	vigo	30	38.03	1141.00
	vida	30	22.97	689.00
	Total	60		
SPRNG_FR	vigo	30	32.53	976.00
	vida	30	28.47	854.00
	Total	60		
CHEW_FR	vigo	30	39.63	1189.00
	vida	30	21.37	641.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	183.500	276.000	274.500	224.000	389.000	176.000
Wilcoxon W	648.500	741.000	739.500	689.000	854.000	641.000
Z	-3.940	-2.573	-2.595	-3.341	-.902	-4.051
Asymp. Sig. (2-tailed)	.000	.010	.009	.001	.367	.000

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	vigo	30	41.42	1242.50
	fino	30	19.58	587.50
	Total	60		
SPRING	vigo	30	23.47	704.00
	fino	30	37.53	1126.00
	Total	60		
CHEW	vigo	30	22.93	688.00
	fino	30	38.07	1142.00
	Total	60		
HARD_FR	vigo	30	42.70	1281.00
	fino	30	18.30	549.00
	Total	60		
SPRNG_FR	vigo	30	26.80	804.00
	fino	30	34.20	1026.00
	Total	60		
CHEW_FR	vigo	30	40.47	1214.00
	fino	30	20.53	616.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	122.500	239.000	223.000	84.000	339.000	151.000
Wilcoxon W	587.500	704.000	688.000	549.000	804.000	616.000
Z	-4.842	-3.120	-3.356	-5.411	-1.641	-4.421
Asymp. Sig. (2-tailed)	.000	.002	.001	.000	.101	.000

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	vigo	30	19.93	598.00
	villa	30	41.07	1232.00
	Total	60		
SPRING	vigo	30	21.12	633.50
	villa	30	39.88	1196.50
	Total	60		
CHEW	vigo	30	18.57	557.00
	villa	30	42.43	1273.00
	Total	60		
HARD_FR	vigo	30	17.00	510.00
	villa	30	44.00	1320.00
	Total	60		
SPRNG_FR	vigo	30	21.30	639.00
	villa	30	39.70	1191.00
	Total	60		
CHEW_FR	vigo	30	18.27	548.00
	villa	30	42.73	1282.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	133.000	168.500	92.000	45.000	174.000	83.000
Wilcoxon W	598.000	633.500	557.000	510.000	639.000	548.000
Z	-4.687	-4.162	-5.293	-5.988	-4.081	-5.426
Asymp. Sig. (2-tailed)	.000	.000	.000	.000	.000	.000

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	vigo	30	35.73	1072.00
	farmhouse	30	25.27	758.00
	Total	60		
SPRING	vigo	30	22.12	663.50
	farmhouse	30	38.88	1166.50
	Total	60		
CHEW	vigo	30	23.78	713.50
	farmhouse	30	37.22	1116.50
	Total	60		
HARD_FR	vigo	30	30.70	921.00
	farmhouse	30	30.30	909.00
	Total	60		
SPRNG_FR	vigo	30	15.50	465.00
	farmhouse	30	45.50	1365.00
	Total	60		
CHEW_FR	vigo	30	19.73	592.00
	farmhouse	30	41.27	1238.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	293.000	198.500	248.500	444.000	.000	127.000
Wilcoxon W	758.000	663.500	713.500	909.000	465.000	592.000
Z	-2.321	-3.718	-2.979	-.089	-6.653	-4.775
Asymp. Sig. (2-tailed)	.020	.000	.003	.929	.000	.000

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	vigo	30	15.72	471.50
	bernardi	30	45.28	1358.50
	Total	60		
SPRING	vigo	30	17.90	537.00
	bernardi	30	43.10	1293.00
	Total	60		
CHEW	vigo	30	17.00	510.00
	bernardi	30	44.00	1320.00
	Total	60		
HARD_FR	vigo	30	17.47	524.00
	bernardi	30	43.53	1306.00
	Total	60		
SPRNG_FR	vigo	30	15.70	471.00
	bernardi	30	45.30	1359.00
	Total	60		
CHEW_FR	vigo	30	16.67	500.00
	bernardi	30	44.33	1330.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	6.500	72.000	45.000	59.000	6.000	35.000
Wilcoxon W	471.500	537.000	510.000	524.000	471.000	500.000
Z	-6.557	-5.589	-5.988	-5.781	-6.564	-6.136
Asymp. Sig. (2-tailed)	.000	.000	.000	.000	.000	.000

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	vida	30	34.13	1024.00
	fino	30	26.87	806.00
	Total	60		
SPRING	vida	30	28.00	840.00
	fino	30	33.00	990.00
	Total	60		
CHEW	vida	30	28.02	840.50
	fino	30	32.98	989.50
	Total	60		
HARD_FR	vida	30	38.53	1156.00
	fino	30	22.47	674.00
	Total	60		
SPRNG_FR	vida	30	25.47	764.00
	fino	30	35.53	1066.00
	Total	60		
CHEW_FR	vida	30	30.83	925.00
	fino	30	30.17	905.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	341.000	375.000	375.500	209.000	299.000	440.000
Wilcoxon W	806.000	840.000	840.500	674.000	764.000	905.000
Z	-1.612	-1.109	-1.101	-3.563	-2.232	-.148
Asymp. Sig. (2-tailed)	.107	.267	.271	.000	.026	.882

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	vida	30	17.40	522.00
	villa	30	43.60	1308.00
	Total	60		
SPRING	vida	30	24.83	745.00
	villa	30	36.17	1085.00
	Total	60		
CHEW	vida	30	20.57	617.00
	villa	30	40.43	1213.00
	Total	60		
HARD_FR	vida	30	16.17	485.00
	villa	30	44.83	1345.00
	Total	60		
SPRNG_FR	vida	30	20.67	620.00
	villa	30	40.33	1210.00
	Total	60		
CHEW_FR	vida	30	16.63	499.00
	villa	30	44.37	1331.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	57.000	280.000	152.000	20.000	155.000	34.000
Wilcoxon W	522.000	745.000	617.000	485.000	620.000	499.000
Z	-5.810	-2.514	-4.406	-6.357	-4.361	-6.150
Asymp. Sig. (2-tailed)	.000	.012	.000	.000	.000	.000

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	vida	30	27.93	838.00
	farmhouse	30	33.07	992.00
	Total	60		
SPRING	vida	30	24.83	745.00
	farmhouse	30	36.17	1085.00
	Total	60		
CHEW	vida	30	27.83	835.00
	farmhouse	30	33.17	995.00
	Total	60		
HARD_FR	vida	30	21.50	645.00
	farmhouse	30	39.50	1185.00
	Total	60		
SPRNG_FR	vida	30	16.20	486.00
	farmhouse	30	44.80	1344.00
	Total	60		
CHEW_FR	vida	30	16.87	506.00
	farmhouse	30	44.13	1324.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	373.000	280.000	370.000	180.000	21.000	41.000
Wilcoxon W	838.000	745.000	835.000	645.000	486.000	506.000
Z	-1.138	-2.514	-1.183	-3.992	-6.343	-6.047
Asymp. Sig. (2-tailed)	.255	.012	.237	.000	.000	.000

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	vida	30	15.60	468.00
	bernardi	30	45.40	1362.00
	Total	60		
SPRING	vida	30	18.13	544.00
	bernardi	30	42.87	1286.00
	Total	60		
CHEW	vida	30	17.50	525.00
	bernardi	30	43.50	1305.00
	Total	60		
HARD_FR	vida	30	15.50	465.00
	bernardi	30	45.50	1365.00
	Total	60		
SPRNG_FR	vida	30	16.37	491.00
	bernardi	30	44.63	1339.00
	Total	60		
CHEW_FR	vida	30	16.33	490.00
	bernardi	30	44.67	1340.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	3.000	79.000	60.000	.000	26.000	25.000
Wilcoxon W	468.000	544.000	525.000	465.000	491.000	490.000
Z	-6.609	-5.486	-5.766	-6.653	-6.269	-6.283
Asymp. Sig. (2-tailed)	.000	.000	.000	.000	.000	.000

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	fino	30	16.58	497.50
	villa	30	44.42	1332.50
	Total	60		
SPRING	fino	30	25.20	756.00
	villa	30	35.80	1074.00
	Total	60		
CHEW	fino	30	21.03	631.00
	villa	30	39.97	1199.00
	Total	60		
HARD_FR	fino	30	15.70	471.00
	villa	30	45.30	1359.00
	Total	60		
SPRNG_FR	fino	30	25.13	754.00
	villa	30	35.87	1076.00
	Total	60		
CHEW_FR	fino	30	16.50	495.00
	villa	30	44.50	1335.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	32.500	291.000	166.000	6.000	289.000	30.000
Wilcoxon W	497.500	756.000	631.000	471.000	754.000	495.000
Z	-6.173	-2.351	-4.199	-6.564	-2.380	-6.209
Asymp. Sig. (2-tailed)	.000	.019	.000	.000	.017	.000

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	fino	30	24.67	740.00
	farmhouse	30	36.33	1090.00
	Total	60		
SPRING	fino	30	25.25	757.50
	farmhouse	30	35.75	1072.50
	Total	60		
CHEW	fino	30	29.07	872.00
	farmhouse	30	31.93	958.00
	Total	60		
HARD_FR	fino	30	16.87	506.00
	farmhouse	30	44.13	1324.00
	Total	60		
SPRNG_FR	fino	30	16.17	485.00
	farmhouse	30	44.83	1345.00
	Total	60		
CHEW_FR	fino	30	16.23	487.00
	farmhouse	30	44.77	1343.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	275.000	292.500	407.000	41.000	20.000	22.000
Wilcoxon W	740.000	757.500	872.000	506.000	485.000	487.000
Z	-2.587	-2.329	-.636	-6.047	-6.357	-6.328
Asymp. Sig. (2-tailed)	.010	.020	.525	.000	.000	.000

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	fino	30	15.50	465.00
	bernardi	30	45.50	1365.00
	Total	60		
SPRING	fino	30	17.50	525.00
	bernardi	30	43.50	1305.00
	Total	60		
CHEW	fino	30	17.50	525.00
	bernardi	30	43.50	1305.00
	Total	60		
HARD_FR	fino	30	15.50	465.00
	bernardi	30	45.50	1365.00
	Total	60		
SPRNG_FR	fino	30	16.83	505.00
	bernardi	30	44.17	1325.00
	Total	60		
CHEW_FR	fino	30	15.77	473.00
	bernardi	30	45.23	1357.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	.000	60.000	60.000	.000	40.000	8.000
Wilcoxon W	465.000	525.000	525.000	465.000	505.000	473.000
Z	-6.653	-5.766	-5.766	-6.653	-6.062	-6.535
Asymp. Sig. (2-tailed)	.000	.000	.000	.000	.000	.000

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	villa	30	41.87	1256.00
	farmhouse	30	19.13	574.00
	Total	60		
SPRING	villa	30	28.55	856.50
	farmhouse	30	32.45	973.50
	Total	60		
CHEW	villa	30	37.47	1124.00
	farmhouse	30	23.53	706.00
	Total	60		
HARD_FR	villa	30	44.20	1326.00
	farmhouse	30	16.80	504.00
	Total	60		
SPRNG_FR	villa	30	16.47	494.00
	farmhouse	30	44.53	1336.00
	Total	60		
CHEW_FR	villa	30	38.70	1161.00
	farmhouse	30	22.30	669.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	109.000	391.500	241.000	39.000	29.000	204.000
Wilcoxon W	574.000	856.500	706.000	504.000	494.000	669.000
Z	-5.041	-.865	-3.090	-6.076	-6.224	-3.637
Asymp. Sig. (2-tailed)	.000	.387	.002	.000	.000	.000

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	villa	30	22.03	661.00
	bernardi	30	38.97	1169.00
	Total	60		
SPRING	villa	30	17.88	536.50
	bernardi	30	43.12	1293.50
	Total	60		
CHEW	villa	30	20.73	622.00
	bernardi	30	40.27	1208.00
	Total	60		
HARD_FR	villa	30	38.37	1151.00
	bernardi	30	22.63	679.00
	Total	60		
SPRNG_FR	villa	30	18.13	544.00
	bernardi	30	42.87	1286.00
	Total	60		
CHEW_FR	villa	30	29.53	886.00
	bernardi	30	31.47	944.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	196.000	71.500	157.000	214.000	79.000	421.000
Wilcoxon W	661.000	536.500	622.000	679.000	544.000	886.000
Z	-3.756	-5.596	-4.332	-3.489	-5.485	-.429
Asymp. Sig. (2-tailed)	.000	.000	.000	.000	.000	.668

a Grouping Variable: BRAND

Ranks

	BRAND	N	Mean Rank	Sum of Ranks
HARD	farmhouse	30	15.77	473.00
	bernardi	30	45.23	1357.00
	Total	60		
SPRING	farmhouse	30	20.03	601.00
	bernardi	30	40.97	1229.00
	Total	60		
CHEW	farmhouse	30	17.57	527.00
	bernardi	30	43.43	1303.00
	Total	60		
HARD_FR	farmhouse	30	16.47	494.00
	bernardi	30	44.53	1336.00
	Total	60		
SPRNG_FR	farmhouse	30	32.10	963.00
	bernardi	30	28.90	867.00
	Total	60		
CHEW_FR	farmhouse	30	20.00	600.00
	bernardi	30	41.00	1230.00
	Total	60		

Test Statistics(a)

	HARD	SPRING	CHEW	HARD_FR	SPRNG_FR	CHEW_FR
Mann-Whitney U	8.000	136.000	62.000	29.000	402.000	135.000
Wilcoxon W	473.000	601.000	527.000	494.000	867.000	600.000
Z	-6.535	-4.643	-5.736	-6.224	-.710	-4.657
Asymp. Sig. (2-tailed)	.000	.000	.000	.000	.478	.000

a Grouping Variable: BRAND

Appendix 11. Nonparametric Correlations (Sensory analysis *Vs* instrumental analysis *Batch* 1)

Correlations

			TA_HARD	ORG_HARD
Spearman's rho	TA_HARD	Correlation Coefficient	1.000	.429
		Sig. (2-tailed)	.	.397
		N	6	6
	ORG_HARD	Correlation Coefficient	.429	1.000
		Sig. (2-tailed)	.397	.
		N	6	6

Correlations

			TA_SPR	ORG_SPR
Spearman's rho	TA_SPR	Correlation Coefficient	1.000	.771
		Sig. (2-tailed)	.	.072
		N	6	6
	ORG_SPR	Correlation Coefficient	.771	1.000
		Sig. (2-tailed)	.072	.
		N	6	6

Correlations

			TA_CHW	ORG_CHW
Spearman's rho	TA_CHW	Correlation Coefficient	1.000	.145
		Sig. (2-tailed)	.	.784
		N	6	6
	ORG_CHW	Correlation Coefficient	.145	1.000
		Sig. (2-tailed)	.784	.
		N	6	6

Appendix 12. Nonparametric Correlations (Sensory analysis *Vs* instrumental analysis *Batch* 2)

Correlations

			TA_HARD	ORG_HARD
Spearman's rho	TA_HARD	Correlation Coefficient	1.000	.943(**)
		Sig. (2-tailed)	.	.005
		N	6	6
	ORG_HARD	Correlation Coefficient	.943(**)	1.000
		Sig. (2-tailed)	.005	.
		N	6	6

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

Correlations

			TA_SPR	ORG_SPR
Spearman's rho	TA_SPR	Correlation Coefficient	1.000	.771
		Sig. (2-tailed)	.	.072
		N	6	6
	ORG_SPR	Correlation Coefficient	.771	1.000
		Sig. (2-tailed)	.072	.
		N	6	6

Correlations

			TA_CHW	ORG_CHW
Spearman's rho	TA_CHW	Correlation Coefficient	1.000	.783
		Sig. (2-tailed)	.	.066
		N	6	6
	ORG_CHW	Correlation Coefficient	.783	1.000
		Sig. (2-tailed)	.066	.
		N	6	6

Appendix 13. Survey Result of market acceptance of various beef sausages brands

Brands	Hero	Gelael	Sri Ratu	Alfa
Kimbo	G	B	X	B
Farm House	G	G	X	B
Fino	B	X	X	G
Vigo	B	X	X	G
Chami	B	G	B	B
Andy	B	X	X	X
Vida	G	X	G	G
Abby	B	X	X	B
Besto	B	X	X	X
Bernardi	G	G	G	G
Villa	X	G	G	B

Note:
G - Good selling
B - Bad selling
X - Not available in the related supermarket