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Sensory Characteristics and Consumer Preference for Cooked Chicken Breasts from Organic, Corn-fed, Free-range and Conventionally Reared Animals

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Abstract: The sensory characteristics of cooked chicken breasts from organic (n=4), corn-fed (n=1), free range (n=5) and conventionally (n=5) reared animals from conventional origins were determined. Twelve trained assessors described the sensory characteristics of all samples using twenty-one attributes. One-way analysis of variance showed significant ($P<0.05$) differences between samples for all appearance, one odour, one flavour, and all texture attributes. Principal component analysis (PCA), on significant discriminating attributes, found that three significant ($P<0.05$) principal components, explaining 74% of the experimental variance, described the differences in sensory character between samples. A subset of eight chicken samples was selected for consumer preference testing. One-hundred naïve consumers rated their preference for each sample using a nine-point hedonic scale. Hierarchical cluster analysis identified five segments of consumers who had different preferences demonstrating the heterogeneous nature of consumer preferences. Partial least squares regression, determined relationships between the sensory attributes and each of the five segments. Three segments of consumers, totaling 67% of all sampled consumers, preferred the sensory attributes of meat from conventionally reared animals. Consumers in these segments also liked the sensory attributes of certain organic and free-range samples. The sensory attributes of a free-range sample including "processed" odour, "cream" appearance, "firmness" and "high oral breakdown" texture were preferred by 48% of consumers. However, the sensory attributes of the organic and corn-fed chicken samples were not the most preferred of any consumer segments.

Key words: Reared animals, cooked chicken breasts, sensory characteristics

Introduction

Organic food is one of the fastest growing segments of the European food market. The value of organic food sales has increased from 3.8 billion euro in 1990 to an estimated 5.7 billion euro in 1999, and is currently growing at 20-30% annually (Bord Bia, 2000). In general, there is now a greater demand by consumers for foods perceived as "natural", "fresh tasting", "healthy" and "more nutritious" (Morrissey *et al.*, 1998). Many consumers believe that organic foods are healthier than conventional foods, are produced in a more environmentally compatible manner and "taste" better (IFT, 1990; Wose *et al.*, 1997). When Irish and UK purchasers of organic foods were asked in a recent questionnaire 53% of Irish and 43% of UK consumers believed that organic food "tasted" better than ordinary food (Bord Bia, 2000). Castellini *et al.* (2002) determined the effects of organic production on broiler meat quality characteristics, including sensory character. Using a five point scale, trained assessors scored breast samples, from broilers fed organic diets, significantly ($P<0.05$) higher for "juciness" and "overall acceptability" than breast samples from broilers fed conventional diets. However, despite this reported difference there still exists a relative paucity of published literature concerning sensory, and consumer preference, differences between organic and conventionally produced poultry meat. Organic meat constitutes 12% of European organic food sales and is worth approximately 700 million euro annually (Bord Bia, 2000). Hence, determination of whether there exists a taste and consumer preference difference between organic and conventionally produced meat, and, more importantly, whether sensory attributes are driving consumer preference, are important issues in the meat industry.

The objective of the present work was to determine the sensory attributes of, and consumer preference for, chicken breast meat obtained from animals reared on organic, corn-fed, free-range and conventional diets. Samples were selected to represent the diverse range of "chicken types" available to the Irish consumer, offering alternatives to conventionally produced chicken meat. All samples used in the present work were purchased from a supermarket. Supermarkets are the most popular outlets for organic food, with 62% of Irish consumers listing this as their main source of purchase (Bord Bia, 2000). A second objective was to identify segments of consumers, within the tested consumer population, with similar preference patterns. Finally, partial least squares regression (PLSR) was used to determine the relationship between sensory attributes and clustered consumer preference scores to identify

the sensory attributes that determined the preference of each of the samples.

Materials and methods

Samples: Raw breast fillets from chickens fed organic (n=4), corn-fed (n=1), free-range (n=5) and conventional (n=5) diets were purchased from four local supermarkets (Table 1). Individual raw breast samples were vacuum-packed (Webomatic type D463; Werner Bonk, Bochum, Germany) and stored at -20 °C prior to analysis. The vacuum packaging material consisted of Cryovac® film (45 cm^3/24 h at STP; W. R. Grace Europe Inc., Lausanne, Switzerland).

Sample cooking and preparation: Chicken breast samples were defrosted from -20 °C at room temperature (21 °C) for 12 hours. Individual samples were wrapped in aluminium foil and baked at 180 °C for 25 minutes. Temperature probes were used during cooking to ensure that the internal temperature of the meat reached 85 °C. Samples were cooled on wire racks and subsequently placed in a refrigerator at 4 °C overnight until the morning of the test. Samples for descriptive analysis were cut into uniform 2 cm cubes, equilibrated to room temperature (21 °C) and placed in glass tumblers covered with clock glasses and coded with three digit random numbers. Samples for consumer testing were similarly treated, before being placed in polystyrene cups, covered with clock glasses, and coded with randomly selected three digit random numbers.

Descriptive sensory analysis: Twelve assessors, recruited and screened following international standards (ISO, 1993), participated in the present study. Prior to analysis all assessors participated in five group discussions (each two hours in duration), during which, the appearance, odour, flavour and texture characteristics of all chicken samples were discussed. A final vocabulary was selected and defined and included four odour, eight flavour, four appearance and five texture attributes (Table 1). Each assessor was also provided with a list of all attributes with their definitions during evaluation. Chicken samples were scored for each attribute on unstructured 100 mm line scales labelled at both ends (at 5 and 95%) with extremes of each attribute. Six tasting sessions took place over three consecutive days. Samples were analyzed in triplicate. To prevent biasing effects of order of sample presentation and sample carry-over, within and between days, order of sample presentation to assessors was balanced (MacFie *et al.*, 1989). Each assessor was provided with water and toothpicks and instructed to cleanse their palate before each sample. Data were recorded using the Compusense five V. 3.8 sensory data acquisition programme (Guelph, ON, Canada). All assessments were conducted in individual booths at the sensory laboratory at University College, Cork, which complies with international standards for the design of test rooms (ISO, 1988).

Consumer preference testing: Consumer preference testing was performed as follows. Students and staff members from the University campus were invited to participate in the test. Prior to analysis consumers were questioned about the frequency of their chicken consumption and only consumers who consumed chicken as least once per month were invited to participate in the preference test. Consumers rated their preference for each of the samples on a nine-point hedonic scale using Compusense five v 3.8 programme. Testing conditions were similar to those used for descriptive analysis. Order of sample presentation was balanced (MacFie *et al.*, 1989). One hundred consumers participated in the test.

Data analysis: Descriptive sensory data were analyzed as follows. Scores were averaged across assessors for each attribute and the ability of each attribute to discriminate between chicken samples was investigated using one-way analysis of variance (ANOVA) (SPSS v 10.0 SPSS Inc. Chicago, IL, USA). The acceptable significance level was set at $P<0.05$. Attributes which did not significantly ($P>0.05$) discriminate between chicken samples were removed from subsequent analysis. Data were standardized (1/standard deviation) and analyzed by means of principal component analysis (PCA) (Piggott and Sharman, 1986) using Guideline +7.5 (CAMO ÅS, N-7041 Trondheim, Norway). How each principal component (PC) discriminated between chicken samples was determined by performing an ANOVA (SPSS v 10.0 SPSS Inc.) on chicken scores prior to averaging across replicates. Data were then averaged across replicates and a further PCA was carried out. The final number of components for interpretation was based on the discriminating ability ($P<0.05$) of each PC. Selection of a reduced set of chicken samples for consumer preference testing was performed as follows. The first three PCs (PC1 vs. PC2; PC1 vs. PC3) were plotted and eight samples (two organic, one corn-fed, two free-range and three conventional samples), that were representative of the sensory space were selected. Consumer preference data was analyzed by internal preference mapping (Carroll, 1972) using Guideline v 7.5 (CAMO AS, N-7041 Trondheim, Norway). Internal preference mapping carried out using PCA of the individual consumer preference scores. Prior to PCA data were standardized (1/standard deviation). The result was a plot in which consumers were represented as the individual variables determining the direction and

Table 1: Chicken breast samples used in the study, their corresponding codes, description, country of origin and retail source

Number	Code	Description	Country of Origin	Source*
1	O-Fr(a)	Organic	France	a
2	O-NI(b)	Organic	Northern Ireland	b
3	O-Fr(b)	Organic	France	b
4	O-NI(c)	Organic	Northern Ireland	c
5	CF-Fr(a)	Corn fed	France	a
6	FR-E(a)	Free-range	UK	a
7	FR-NI(b)	Free-range	Northern Ireland	b
8	FR-Ir(b)	Free-range	Ireland	b
9	FR-Fr(b)	Free-range	France	b
10	FR-Ir(c)	Free-range	Ireland	c
11	C-Ir(a)	Conventional	Ireland	a
12	C-Ir(b)	Conventional	Ireland	b
13	C-Ir(c)	Conventional	Ireland	c
14	C-Ir(d)	Conventional	Ireland	d
15	C-Ir(d)	Conventional	Ireland	d

*Source refers to the different commercial suppliers.

intensity of average differences in preferences for each of the eight chicken samples.

Hierarchical cluster analysis, with squared Euclidean distances and Ward's method (Jacobsen and Gunderson, 1986) was performed using SPSS v 10.0 (SPSS Inc.). Cluster analysis was performed to segment the consumer sample, as it is generally found that consumer preferences are not the same, and that the overall mean preference is not very informative.

External preference mapping (Martens and Martens, 1986) was carried out to determine the relationship between sensory attributes and consumer preference segments by PLSR type 2 (PLSR2) (Martens and Martens, 2000), using Guideline +7.5 (CAMO ÅS). PLSR2 is used to regress several X-variables (sensory attributes) against Y-variables (consumer preference clusters). All data were standardized (1/standard deviation) prior to analyses. The predictive ability (testing reproducibility) was tested by full cross-validation.

Results and Discussion

Descriptive sensory analysis: One-way ANOVA carried out on the duplicate sensory scores showed significant ($P<0.05$) differences between samples for all appearance attributes, "processed" odour, "strength of roast chicken" and "astringent" flavour, as well as all texture attributes (Table 3). Clearly, the sensory panel found it easier to distinguish between chicken samples using appearance and texture rather than odour and flavour attributes. A PCA on duplicate sensory data showed that three significant ($P<0.05$) PCS, accounting for 74% of the explained variance, were needed to explain differences in sensory character between samples. PCs 1 and 2, accounting for 59% of the explained variance, are shown in Fig. 1.

PC1 distinguished the sensory characters of organic sample 3 [O-Fr(b)] and free-range sample 7 [FR-NI(b)] from conventional samples 11 [C-Ir(a)] and 12 [C-Ir(b)]. Organic sample O-Fr(b) and free-range sample FR-NI(b) were characterized by their "astringent" flavour and the texture attributes "firmness", "glue" and "high oral breakdown" (Fig. 1). Conventional samples [C-Ir(a)] and [C-Ir(b)], on the other hand, were characterized by their "cream", "moist" and "compact" appearance and "overall impression of moisture" texture. PC2 separated the "yellow" appearance, "strength of roast chicken" flavour and "crumbly" texture of corn-fed sample 5 [CF-Fr(a)] from the "cream" and "moist" appearance and "firmness", "glue" and "overall impression of moisture" texture of free-range sample 7 [FR-NI(b)] and to a lesser extent, conventional samples 10 (Fr-Or(c)) and 11 [C-Ir(a)]. PC3 described more subtle differences between chicken samples distinguishing the "processed" odour, "astringent" flavour and "yellow" and "compact" appearance of organic samples 1 [O-Fr(a)] and 3 [O-Fr(b)] and conventional sample 12 [C-Ir(b)] from the "strength of roast chicken flavour" and "cream" appearance of conventional sample 14 [C-Ir(d)].

Differences in sensory character between the chicken samples may be as a result of a number of factors. In a parallel study (Lawlor *et al.*, 2003), using a selection of the samples used in the current study differences in lipid oxidation, α-Tocopherol and fatty acid profiles were investigated. In general the extent of lipid oxidation was higher in burgers made from breast meat of organic and free-range animals than those made from conventionally reared animals.

Chicken breast samples from animals reared under different regimes and available to the Irish consumer clearly show differences in sensory characteristics. In general, odour and flavour attributes were not as

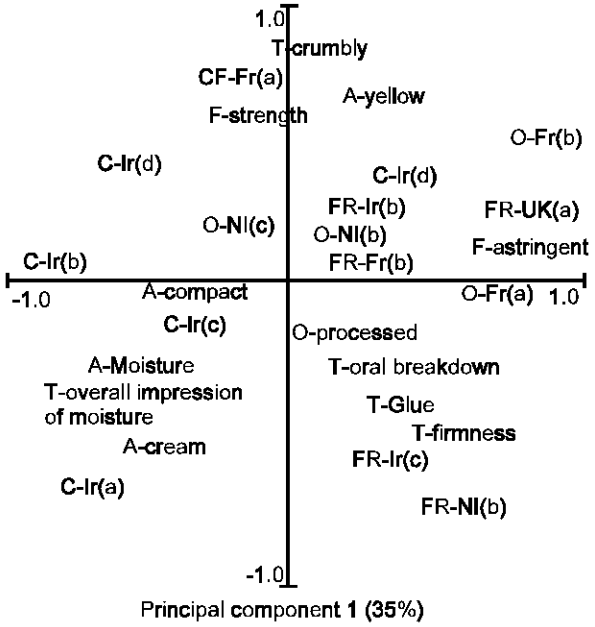

Fig. 1: Result of principal component analysis on significantly ($P<0.05$) discriminating sensory attributes of chicken samples. For identification of sample codes refer to Table 1 (C = Conventionally, O = Organic, FR = Free-Range, CF = Corn-Fed). For full definitions of sensory attributes refer to Table 2 (O = odour attributes, F = flavour attributes, A = appearance attributes, T = texture attributes).

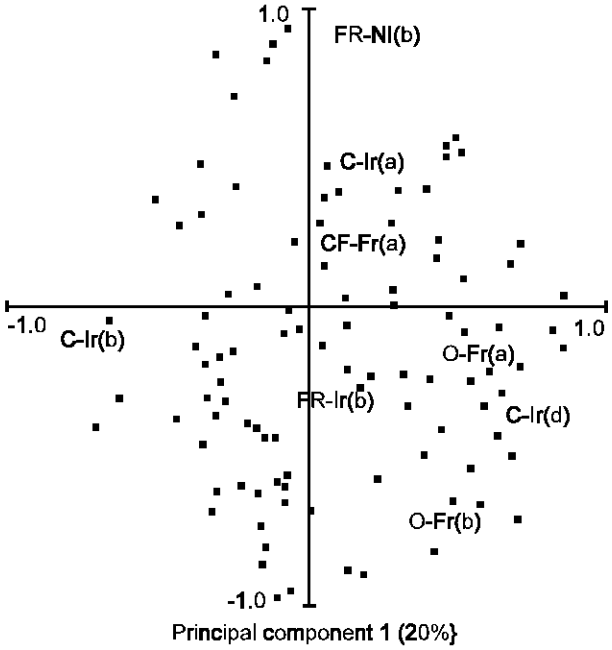

Fig. 2: Result of principal component analysis showing the individual preference scores of 100 consumers (squares) for the reduced set of chicken samples (bold font) investigated. For identification of sample codes refer to Table 1 (C = Conventionally, O = Organic, FR = Free-Range, CF = Corn-Fed).

discriminatory as texture and appearance. Animals reared under organic and free-range systems have similar physical activity, while those reared under conventional systems are likely to be physically restricted. The increased physical activity found in animals reared under less restricted regimes may have resulted in the different texture and appearance characteristics.

Consumer preference test: Due to the large number of chicken samples investigated in the present work a reduced set of eight samples were selected for consumer preference testing. Selection of the reduced sample set was based on visual inspection of plots of the first 3 PCS. Organic samples 1 [O-Fr(a)] and 3 [O-Fr(b)], corn-fed-sample 5 [CF-Fr(a)], free-range samples 7 [FR-NI(b)] and 8 [FR-Ir(b)], and conventional samples 11 [C-Ir(a)], 12 [C-Ir(b)] and 14 [C-Ir(d)], were chosen as representative of the sensory space. Helgesen and Næs (1995) carried out a similar procedure for selection of a reduced sample for consumer preference testing.

Internal preference mapping, using PCA, of the consumer preference scores for the eight chicken samples showed that the first two PCS accounted for 38% of the total variation (Fig. 2). Organic samples 1 [O-Fr(a)] and 3 [O-Fr(b)] and conventional sample 14 [C-Ir(d)] were similarly preferred by consumers and seemed to have similar sensory characteristics. Conventional sample 12 [C-Ir(b)] on the other hand, was preferred differently from all other samples and was described in Fig. 1 as having "cream", "moist" and "compact" appearance and "moist" texture. However, samples 5 [CF-Fr(a)], 8 [Fr-Ir(b)] and 11 [C-Ir(a)] while exhibiting differences in sensory characteristics were equally liked. Thus, there was no clear visual segmentation of consumer preference scores and it was concluded that while internal preference mapping did indicate the overall preference of consumers it did not sufficiently explain the preference patterns of consumers (Arditi, 1997; Helgesen *et al.*, 1997; Murray and Delahunty, 2000). Tang *et al.* (2000) reported that using mean values only captured the most manifest consumer preference patterns, while studying individual responses by further categorizing major preference patterns provided an opportunity to discover hidden information, masked by data averaging.

Cluster analysis: Hierarchical cluster analysis showed that the sampled consumer population consisted of five

Table 2: Descriptive attributes and their definitions used to evaluate samples

Attribute	Definition
Appearance of uncut outer surface	
Cream	Colour ranging from "Tainted with another colour" to "pure cream".
Yellow tinge	Yellow colour
Appearance of cut inner surface	
Moisture content	Appearance of moisture on the inside of the fillet ranging from dry to moist.
Compactness	Compact, firm, compressed and/or smooth appearance of the chicken fillet.
Odour	
Blood/metallic	Odour associated with blood, a metallic smell.
Strength of roast chicken	Odour associated roast chicken.
Fatty	Odour of cold cooked fat.
Processed	Processed odour associated with chemicals. May also smell like cardboard.
Flavour	
Strength of chicken	Taste associated with roast chicken.
Metallic	A metallic taste.
Oily/Chicken fat	Taste associated with cold chicken fat.
Astringent	Mouth drying, harsh. The complex of drying, puckering and shrinking sensations in the lower cavity causing contractions of the body tissue.
Sweet	Fundamental taste sensation of which sucrose is typical.
Acidic	Sour tangy, citrus-like, the fundamental taste sensations of which lactic acids and citric acids are typical.
Salty	Fundamental taste sensation of which sodium chloride is typical.
Bitter	Chemical-like, disprin, aspirin. Taste sensations of which caffeine and quinine are typical. Beer/hops.
Texture	
Firmness of initial bite	Ranging from "soft" to "firm". The extent of resistance offered by the chicken, judged in the first half of chewing using the front teeth.
Crumbly	The extent to which the chicken structure breaks up in the mouth, assessed during the first 2-3 chews.
Gluey	Sticking to teeth.
Oral breakdown	Length of chew time.
Overall impression of moisture	The perceived moisture content of the chicken after it has been completely chewed and swallowed.

clusters or segments of consumers with homogenous preference patterns (Table 4).

Overall, consumers most preferred conventional chicken sample 14 [C-Ir(d)] and free-range sample 8 [FR-Ir(b)] (Table 4). Consumers least preferred free-range sample 7 [FR-NI(b)]. However, examination of the preference scores within each of the five clusters revealed quite a different preference trend.

Consumers in cluster 1, the largest cluster containing 31% of consumers tested, most preferred free-range chicken sample 7 [(FR-NI(b)] and conventional sample 14 [C-Ir(d)] and least preferred organic sample 1 [O-Fr(a)]. Consumers in cluster 2, containing 16% of consumers, most preferred conventional sample 14 [C-Ir(d)] and least preferred conventional chicken sample 12 [C-Ir(b)]. Conventional sample 12 [C-Ir(b)], however, was the most preferred sample of the second largest cluster, cluster 3, containing 20% of consumers. Cluster 3 least preferred free-range sample 7 [FR-NI(b)]. In contrast to cluster 3, consumers in cluster 4, containing 17% of consumers, most preferred free-range sample 7 [FR-NI(b)] and least preferred conventional sample 12 [C-Ir(b)]. Cluster 5, containing 16% of consumers, most preferred conventional sample 12 [C-Ir(b)] and least preferred conventional sample 11.

Organic samples 1 [O-Fr(a)] and 3 [O-Fr(b)], corn-fed sample 5 [CF-Fr(a)] and free-range sample 8 [FR-Ir(b)] were not the most preferred samples of any consumer cluster. In fact, organic sample 1 was the least preferred sample of the largest consumer cluster, cluster 1, containing 31% of consumers. The most preferred chicken samples included the following: free-range sample 7 [FR-NI(b)], the preferred sample of two consumer clusters containing a total of 48% of consumers, conventional sample 14 [C-Ir(d)], preferred by two clusters of consumers containing a total of 47% of consumers, and conventional sample 12 [C-Ir(b)], also the preferred chicken sample of two consumer clusters containing 36% of consumers. However, as well as identifying the most preferred samples of consumers, it is also important to identify the sensory attributes that determined consumer preference for each of the samples.

Table 3: Mean panel scores for the descriptive sensory attributes for chicken breast samples. The results of one-way analysis of variance (ANOVA) and least significant difference test (LSD) are also shown

	Sample description and code																
	Organic				Corn fed	Free-range					Conventional					P-value	LSD
Attribute	O-Fr(a)	O-NI(b)	O-Fr(b)	O-NI(c)	CF-Fr(a)	FR-UK(a)	FR-NI(b)	FR-Ir(b)	FR-Fr(b)	FR-Ir(c)	C-I r(a)	C-Ir(b)	C-Ir(c)	C-Ir(d)	C-Ir(d)		
Appearance of uncut outer surface																	
Cream	41	59	31	70	45	53	61	51	65	56	86	61	65	67	63	0.00	13.5
Yellow tinge	18	6	49	9	55	3	6	8	8	5	3	8	7	3	2	0.00	12.6
Appearance of cut inner surface																	
Moisture content	28	24	18	24	30	21	28	25	24	31	40	39	31	17	32	0.02	10.7
Compact	67	69	69	65	68	57	62	71	67	63	73	88	81	48	63	0.00	13.8
Blood/metallic	28	32	35	31	32	30	37	40	31	32	31	38	37	23	32	0.73	12.4
Strength of roast chicken	42	33	46	47	45	49	37	47	49	52	45	48	33	52	55	0.26	13.9
Fatty	14	10	17	16	21	19	17	16	21	12	18	11	12	25	20	0.41	10.0
Processed	23	31	26	18	21	15	39	14	17	7	18	21	26	20	14	0.04	13.1
Flavour																	
Strength of roast chicken	48	57	56	63	69	55	51	54	62	55	51	57	49	62	69	0.01	10.3
Metallic	28	14	20	11	18	16	18	14	19	16	21	18	21	12	5	0.37	12.2
Oily/chicken fat	21	29	25	21	25	24	19	16	21	16	19	22	16	23	23	0.06	6.65
Astringent	23	12	20	16	13	19	15	17	23	18	10	16	16	14	9	0.03	7.23
Sweet	2	4	3	8	5	6	3	3	9	4	9	8	7	5	8	0.28	4.85
Acidic	7	6	7	10	14	4	9	8	3	9	7	4	4	3	6	0.12	5.70
Salty	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0.95	1.13
Bitter	8	7	12	9	11	12	9	13	6	5	11	9	13	7	6	0.70	7.55
Texture																	
Firmness of initial bite	52	55	47	40	35	53	76	50	43	52	39	32	35	49	36	0.00	12.9
Crumbly	46	56	53	50	58	53	32	49	47	35	39	50	49	54	53	0.03	12.4
Gluey	33	31	38	27	28	30	43	27	42	47	32	20	31	35	25	0.00	9.76
Oral breakdown	56	52	50	43	42	62	69	49	44	64	31	32	40	50	41	0.00	11.3
Overall impression of moisture	21	27	19	33	28	21	32	21	26	32	52	40	36	22	34	0.00	12.4

Relationships between sensory attributes and consumer preference scores: The result of PLSR2 can be seen in Fig. 3. For PCS 1 and 2, 59% of the sensory data explained 51% of the preference data. The sensory attributes that determined consumer preference for each of the consumer clusters were identified.

Consumer cluster 1, the largest consumer cluster with 31% of consumers, preferred the "processed" odour "high oral breakdown", and "glue" texture of conventional sample 14 [C-Ir(d)] and free-range sample 7 [FR-NI(b]. Consumer cluster 2, consisting of 16% of consumers, also showed a preference for the sensory characteristics of conventional sample 14 [C-Ir(d)] as well as the "astringent" flavour and "crumbly" texture of organic samples 1 [O-Fr(a)] and 3 [O-Fr(b)]. Consumer cluster 4, with 17% of consumers, preferred the "glue", "high oral breakdown", and "firm" texture of free-range sample 7 [FR-NI(b)] and disliked the "compact" and "moist" appearance of conventional sample 12 [C-Ir(b)]. On the other hand, consumer clusters 3 and 5, containing 36% of consumers, liked the "compact" appearance and "crumbly" texture of conventional sample 12 [C-Ir(b)] and disliked "processed" odour "high oral breakdown" and "glue" texture of free-range sample 7 [FR-NI(b)].

The sensory characteristics of conventional chicken samples were among the most preferred attributes of three clusters of consumers, consisting of 67% of the sampled consumer population. However, consumers in these clusters also showed a preference for the sensory characteristics of certain organic and free-

Table 4: Mean preference scores within each cluster for each of the cooked chicken breast samples evaluated in the present work. For identification of sample codes refer to Table 1

		Sample description and code							
		Organic		Corn-fed	Free-range		Conventional		
	Number	1	3	5	7	8	11	12	14
	CODE	O-Fr(a)	O-Fr(b)	CF-Fr(a)	FR-NI(b)	FR-Ir(b)	C-Ir(a)	C-Ir(b)	C-Ir(d)
Cluster	n								
1	31	5.35	6.00	6.55	**7.03**	6.71	6.00	6.61	**7.03**
2	16	6.19	6.63	4.75	3.50	5.44	5.63	**2.56**	**6.75**
3	20	6.00	6.75	4.95	3.30	6.55	5.40	**7.00**	5.10
4	17	6.06	5.12	5.35	6.94	6.29	5.06	2.82	5.00
5	16	4.00	3.75	5.31	3.63	4.69	3.31	**6.31**	5.94
All	100	5.52	5.65	5.38	4.88	**5.94**	5.08	5.06	**5.96**

n =number of consumers in each cluster. "Winner" chicken breast samples within each cluster are in **bold**. "Loser" chicken breast samples are in italic font.

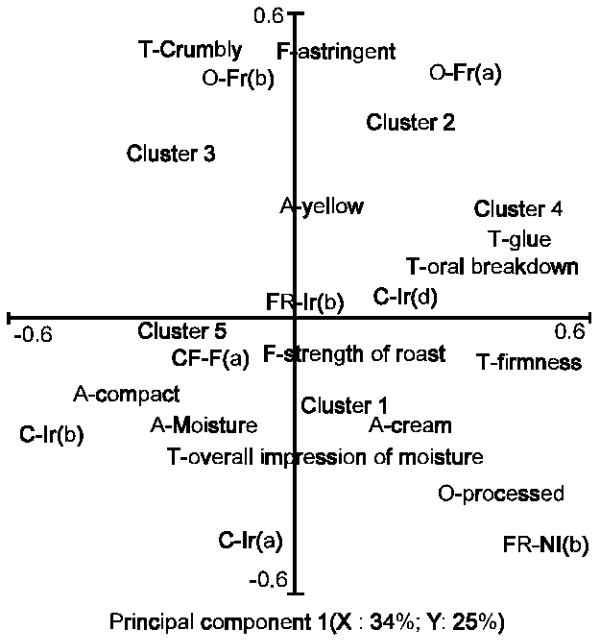

Fig. 3: Result of partial least squares regression showing the relationship between sensory attributes (for full definitions of sensory attributes refer to Table 2, O = odour attributes, F = flavour attributes, A = appearance attributes, T = texture attributes), and consumer clusters (Clusters 1-5) of chicken samples (bold font). For identification of sample codes refer to Table 1 (C = Conventionally, O = Organic, FR = Free-Range, CF = Corn-Fed).

range samples. The sensory attributes of a free-range sample including "processed" odour, "cream" appearance, "firmness" and "high oral breakdown" texture were preferred by 48% of consumers. The sensory attributes of the organic and corn-fed chicken samples were not the most preferred of any consumer cluster. However, the sensory attributes of organic sample 1 [O-Fr(a)], including "astringent" flavour were the least preferred of the largest consumer cluster, containing 31% of sampled consumer group.

Conclusion: The sensory characteristics of, and consumer preference for, organic, corn-fed, free range and conventional cooked chicken breast fillets of conventional origin were determined. Differences in sensory character and consumer preference occurred between chicken samples. Consumer preference testing and subsequent modeling of sensory and consumer data revealed that, for the current samples, the sensory attributes of two conventional samples and a free-range sample were the most preferred by consumers. Therefore, results of the present work indicate that chicken breast meat from an organic source does not "taste better" than chicken breast meat from a conventional source. These findings may be of particular interest to consumers who pay premiums of 120-180% over conventional prices for organic chicken meat.

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