FRENCH CONSUMER APPRECIATION OF A NOVEL POLISH-STYLE SAUSAGE

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Background

In Poland, product development of new meat products which are both healthy alternatives as well as novel competitors to the wide range of pork-based products already on the market is being undertaken. Poultry meat is being considered as an alternative using a new source derived from the soft separation of meat and fat from sinew, cartilage and bones, an application employed in the German poultry industry.

After removal of trade restrictions upon entry into an expanded EU, Ploand will likely look to increasing exportation of meat products into European markets. To achieve this successfully, any new meat products must meet the demands and tastes, not only of the consumers in Poland, but also of consumers in these potential new markets.

One such new product, that is a development of a typical Polish pork-based smoked sausage, is a poultry-based cheese-filled smoked sausage. Consumer acceptability of this product is currently being studied in Poland. Its acceptability in other markets which are unfamiliar to similar pork-based products is unknown.

Objectives

The objective of this study was to determine consumer acceptability of a novel Polish cheese-filled, smoked poultry sausage in France.

Materials and methods

Sausages were made in Olsztyn, Poland from a combination of turkey, goose and ostrich meats and transported to France in a chilled state. The turkey meat had been obtained using a Baader soft separator machine (Baader 1200-ST, Lubeck, Germany). The sausages that did not have any added fat, were formed with cubes of a low-fat cheddar-type cheese and smoked. For comparison, to be used for French consumers, 3 other types of sausages, of similar diameter, were bought from a French supermarket: a pork chipolata, a pork frankfurter and a poultry frankfurter with a cheese centre (containing a cheese was similar to sour cream).

A total of 72 consumers from the Clermont Ferrand region in Central France tasted the sausages (in April and May, 2003) after completing a questionnaire asking basic socio-demographic information. The consumers were told that some new sausage products were to be tasted and that two contained cheese. No information of the origin of the products, or their contents was given. The sausages were cooked on a plate grill with frequent turning and presented monadically to the consumer. The order of presentation was determined using Latin-square. Consumers were asked to score the acceptability of each product on a 12.5 cm scale from "I don't like at all" to "I like a lot", with a given midpoint. The consumers were encouraged to write comments.

The acceptability results were analysed by ANOVA and differences between sausage types compared using students t-test. A hierarchical cluster analysis was undertaken using the SAS CLUSTER procedure (SAS, 1996). Three clusters were evident considering the 'distance' between clusters and the profile of the resulting graph. A disjoint cluster analysis was carried out using the SAS FASTCLUS procedure (SAS, 1996) forcing the consumers into the 3 different clusters.

Results and discussion

Acceptability differed significantly (P<0.0001) among the products for the entire panel (Table 1). The cheese-filled smoked sausage was the least acceptable overall with an average score of 3.9 compared to the most acceptable product, the chipolata with an average score of 5.8.

Table 1. Acceptability scores of the sausages.

	Mean (maximum 10)	Standard deviation
Chipolata	5.83	2.38
Frankfurter	4.73	2.72
Cheese-filled frankfurter	4.58	2.67
Cheese-filled smoked sausage	3.90	2.92

Paired comparisons (Table 2) showed that the cheese-filled smoked sausage was less acceptable than the chipolata and the frankfurter (P<0.05), but equally as acceptable as the cheese-filled frankfurter.

Table 2. Differences in acceptability scores of the sausages.

	Pr > |t|
Chipolata vs frankfurter	0.0062
Chipolata vs cheese-filled frankfurter	0.0018
Chipolata vs cheese-filled smoked sausage	<0.0001
Frankfurter vs cheese-filled frankfurter	0.6939
Frankfurter vs cheese-filled smoked sausage	0.0360
Cheese-filled frankfurter vs cheese-filled smoked sausage	0.0876

Of the 72 consumers in total, 42 of them made 149 written comments which are summarised as negative comments, such as "horrible smoky flavour" or "too fatty", or positive, including "interesting new idea" or "good level of fat" (Table 3). Although the sample size was relatively small and therefore extension of this work to the entire French population can only be undertaken with extreme caution, it was clear that most of the comments were negative (62%) with 34 consumers commenting negatively, and in particular, about the smoked nature (14) or the fatness (15) of the cheese-filled smoked sausages. No equivalent smoked sausage could be found in France and these comments may derive from its unfamiliarity. The sausage was made without added fat, but using a low-fat cheese which exuded a lot of oil upon cooking. The presence of the melted cheese could have contributed to the fatty perception of the sausage. Negative comments related to fatness also for the frankfurter (8) and the chipolata (10) and to a lack of taste for the cheese-filled frankfurter.

Table 3. Number of consumers giving comments about the sausages.

Nature of comment	Cheese-filled Smoked negative	Cheese-filled Smoked positive	Frankfurter negative	Frankfurter positive	Chipolata negative	Chipolata positive	Cheese-filled Frankfurter negative	Cheese-filled Frankfurter positive
Consumers commenting	34	13	19	11	20	17	23	12
Fat	15	1	8	1	10	6	3	2
Taste	1	4	4	10	1	13	5	4
Texture	9		7	2	1	5	3	4
Colour	3		6	1	6	3	6	
Smoky	14		2				2	
No taste	1		2		4		9	
Smell	3		3	2		3	2	3
Salt	5		2	1	3	1	1	
Artificial	1		4		3		3	
Novel		8						3
Appearance	1			1	1	3	2	2
After-taste/acid	5							
Traditional/rustic		3				1		

The next step was to try to determine whether or not differences between the acceptability of products could be related to different consumers. For this, a cluster analysis was undertaken on the acceptability scores and three approximately equal sized clusters were retained (Table 4).

Table 4. Mean acceptability scores of the sausages (maximum 10) for each cluster with the significant differences within a cluster represented by different letters (P<0.05).

	Cheese-filled Smoked	Frankfurter	Chipolata	Cheese-filled Frankfurter
Cluster 1	5.8 [b]	5.8 [b]	7.4 [a]	6.1 [b]
Cluster 2	2.2 [b]	2.0 [b]	5.7 [a]	2.0 [b]
Cluster 3	2.9 [b]	5.6 [a]	3.5 [b]	4.8 [a]

Comparing acceptability scores within each cluster of consumers (Table 4), it can be concluded that:
- Cluster 1: 26 consumers (36%) who prefer chipolata, but like all four products
- Cluster 2: 23 consumers (32%) who prefer only the chipolata, (they do not like the other products)
- Cluster 3: 23 consumers (32%) who prefer the frankfurter products (both with and without cheese)

The socio-demographic questionnaire and responses are given in Table 5. The ages of the consumers were well distributed among the age group and 44% of the consumers were men. A large proportion of the consumers were in the lower income groups (<2300 Euros/month) and 63% were married.

To identify characteristics from the socio-demographic profiles relating to consumer acceptability, a chi-square test was applied to each response within each cluster of consumers. The results (degrees of freedom and probability) are given in Table 5 and show that the only socio-demographic characteristic significantly (P<0.025) linked with the consumer clusters was that of 'shopping for meat in the supermarket'. Cluster 1 consumers, who liked all the products, and in particular, the chipolata, did not shop for meat in the supermarket whereas a quarter of the consumers in the other two clusters did shop in supermarkets (Table 6). This result is in contrast to the traditional view that the novelty seekers buy their "trendy" foods at specialist stores or large supermarkets. Instead, the traditionalists who buy their meat at butchers are those that most liked the new smoked cheesy sausages.

Table 6. Relationship between shopping for meat in the supermarket and the clusters of sausage acceptability. Significant differences compared to the entire sample are shown in bold (P<0.05).

	Shop for meat in the supermarket	
	Yes	No
Cluster 1	**0**	100
Cluster 2	26	74
Cluster 3	23	77
Total	16	84

Conclusions

While the sample size was relatively small and therefore extension of this work to the entire French population can only be undertaken with extreme caution, this project has shown that the French consumers studied did not find the cheese–filled smoked sausage acceptable, in particular the smoky and fatty nature of the sausage were disliked. The poultry-based smoked sausage is similar to pork-based smoked sausages familiar to the Polish consumer. However, the added cheese is a novel concept in the Polish market and therefore the acceptability of these products is also being investigated in Poland.

References

SAS. (1999) SAS Users Guide: Statistics. Version 8.1. Cary: SAS Institute Inc.

Table 5. Some socio-demographic information obtained from the consumers

Question	Response options	Consumers		Degrees of freedom	P
		number	%		
What is your age (years)?	16-24	11	15	6	0.562
	25-34	15	21		
	35-44	18	25		
	45-54	17	24		
	>54	11	15		
Gender?	female	39	54	2	0.747
	male	32	44		
Marital status?	Single/widowed	27	38	2	0.214
	married/cohabitating	45	63		
How many people live in your household?	1	15	21	10	0.478
	2	21	29		
	3	11	15		
	4	16	22		
	5+	5	7		
What is the total monthly income of your household? (Euros)	< 1500	17	37	10	0.363
	1500-2299	21	22		
	2300-2999	12	18		
	3000-4499	16	8		
	>4500	2	9		
Are you the member of you household who normally shops for meat?	no	13	18	2	0.215
	yes	56	78		
Where do you normally purchase your meat?	butcher	18	25	2	0.324
	supermarket	59	82	2	**0.025**
	farmer	9	13	2	0.582
How often do you eat meat?	every meal, everyday	7	10	6	0.209
	once a day, everyday	25	35		
	several x/week	38	53		
	1x/week	0	0		
	<1x/week	1	1		
	never	0	0		
How often do you eat small-goods products?	every meal, everyday	0	0	8	0.247
	once a day, everyday	2	3		
	several x/week	38	53		
	1x/week	21	29		
	<1x/week	9	13		
	never	2	3		
List some new foods you have recently eaten. (number of products given)	0	8	11	12	0.131
	1	15	21		
	2	18	25		
	3	11	15		
	4	11	15		
	5	8	11		
	6	1	1		
List some foreign foods you have recently eaten. (number of foods listed)	0	9	13	14	0.380
	1	7	10		
	2	13	18		
	3	20	28		
	4	14	19		
	5	7	10		
	6	1	1		
	7	1	1		