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The UK Consumer's Attitudes to, and Willingness to Pay for, imported Foods

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Summary

We report results from an investigation into consumer preferences for locally produced foods. Using a choice experiment we estimate willingness to pay for foods of a designated origin together with certification for Organic and GM free status. Our results indicate that there is a preference for locally produced food which is GM free, Organic and produced in the traditional season.

KEYWORDS: imported food, seasonality, willingness-to-pay, choice experiment

1. Introduction

This paper reports the results of a UK-wide consumer survey conducted in 2005, aiming at assessing consumers' attitudes towards, and willingness to pay for, local and national foods compared to imported alternatives.

The current literature on issues surrounding consumption in relation to the origin of products consists of four main focus areas. The first two are generally more transactional economic studies using techniques such as cost-benefit analysis or choice experiment: price, willingness to pay, labelling and traceability, and accessibility and convenience on the one hand; the concept of food miles on the other. The second two areas are more consumer behaviour (or socio-psychological) oriented: ethical and moral issues (including fair trade, animal welfare, the environment), and patriotism or food ethnocentrism based on culture, religion or politics (Bruning, 1997) on the one hand; information, knowledge and the use of extrinsic cues on the other (Grunerts, 1997; Hobbs, 2003).

Previous research focusing on consumers' perceptions of the country of origin of products has generally classified consumer behaviour issues in terms of either two components or three dimensions. The components include country of origin as a cue for quality, dependability, reliability about a product when there is little or no other information available; and secondly, relating to a person's group identity or national pride (Bruning, 1997). Nes and Bilkey (1993) noted that country of origin should not be discussed as the sole issue regarding product purchase, as it is merely one of several attributes which may influence purchase decisions. In order to compare and measure, the importance of locality of production of the food needs therefore to be placed alongside other attributes which may influence purchase, such as ethical standards (e.g., organic or GM-free production), or seasonality of the product.

Our research focuses on two products, lamb chops and strawberries. Initial results from focus groups indicated that the decision to accept or reject local foods is based partly on factors such as the price relative to imported food, and any ethical and environmental factors associated with production of the food (e.g., organic, GM free). In addition, individual characteristics of consumers such as their socio-psychological approaches and demographics may influence the decision about whether to buy local food.

Choice modelling is an attractive way of approaching the issue of local foods purchase, as choices are presented in a manner that takes into account the multiple attributes of food and highlights the trade-offs between them. The questionnaire also included questions on the

psychological and sociological determinants of choice of local food relating to attitudes and social norms. The choice experiments model consumers' utility from food as a function of price, location of production, seasonality and whether the food is organic or GM free.

2. Background

Our questionnaire was designed following explanatory research: four focus groups conducted at the University of Reading in June 2005 provided primary information about consumers' attitudes to, and willingness to pay for food attributes such as place of production and seasonal availability. Key findings from these focus groups were that local foods were perceived to be of better quality and fresher than national or imported foods. Participants, especially female, felt as well that local food in season was tastier. Local foods were however perceived to be more expensive and inconvenient, as well as less available. Older participants appeared more aware and interested in the origin of their food, especially males, who preferred to buy British, rather on ethnocentric grounds than issues of quality and taste.

We focused on two products: a 500-gram pack of fresh lamb chops and a 500-gram pack of fresh strawberries. After piloting, five attributes were chosen to create an unlabeled experiment, each attribute presenting either 2 or 4 levels; these are summarised in table (1).

Table (1) here

We are dealing here with one linear effect, price, and four non-linear effects which require a higher number of degrees of freedom for consistent estimation. As a consequence, a full factorial design would have imposed too many questions on each respondent,¹ and we therefore opted for a fractional design, reducing the number of cards to 25. As this was still too high, it has been decided to present each respondent with 12 choice questions for lamb, and another 12 for strawberries. We opted for three-option choices in each question, with no status quo or no consumption option. Three sets of 25 cards were independently generated in SPSS, so as to ensure orthogonality of the design. Questionnaires were then created by randomly selecting from those three sets to generate as many choice sets as required, following the technique suggested by Louviere, Hensher and Swait (2000). Table (2) gives an example of a choice question for lamb, while a complete example questionnaire is given in appendix.

Table (2) here

3. Data

A nationally representative survey across the UK was conducted in late 2005, on a total of 222 respondents stratified for four socio-economic groups. The sampling unit was the household, the respondent being the person in charge of food purchasing; the survey was carried out through face-to-face in-home interviews, thus ensuring a near maximum response rate (only one response had to be dropped, upon request of the respondent). The questionnaires also included a section addressing respondents' behavioural perceptions and values designed following the theory of planned behaviour (TPB), and a more general section about each respondent's characteristics, such as age, household composition, *etc.*

The gender ratio is quite unbalanced, with 71% female: this can be explained by the fact that the person in charge of buying food for the household was targeted. The age mean is 44 years, with a median at 41, the youngest respondent being 18 (male), the eldest being 93 (male). Nationality was recorded as well, with 79% of the sample being British, 6% being

¹ A total of 256 possible cards per product, and a grand total of over 16 million unique choice sets if each card were to be presented with another two to choose from.

from another country of the European Union, 5% being from Bangladesh, 5% from an African country.

Annual income was recorded as brackets of £10,000: 45% of our sample is below £10,000 per year, and 77% below £30,000. Concerning education, 57% have a secondary school level, 15% a tertiary school level, 20% graduated from university while 8% have no formal education. Fifty-six percent are employed, either full-time (37%) or part-time (19%), while the others are mostly looking after their home (19%) or retired (15%); unemployed account for 7%, students for 3%. Of those employed, more than 76% are employees, either manual (30%) or not (46%), 11% are self-employed professionals, 7% are executives.

The average household size is 3 (median = 3), with a minimum of 1 and a maximum of 8; just under half of the households have children under 18 years of age, 46% of which have a least one child under 3, 81% have at least one child between 3 and 10, and 83% at least one child between 10 and 18. Weekly spending on food was recorded as well, with 63% spending between £50 and £100 per week, 26% less than £50, and 12% more than £100. Postcode information allowed us to determine that one third of our sample have a rural dwelling, while the other two thirds are urban, 40% of the total living in the Greater London area. Finally, 12% of respondents reported the presence of at least one vegetarian in their households.

Seven-point scales were used as well to assess people's concern for food origin, which appears as high, with a mean score of 3.5 on a scale from 0 to 6; local foods were also deemed to be tastier and fresher. Respondents also tended to agree that by purchasing local foods they would be helping local farmers; to a lesser extent, they also tended to agree that buying local meant limited choice.

Respondents were then asked how strongly they agreed or disagreed with statements relating to their own evaluation of shopping for local foods. Mean scores suggested that they were fairly neutral; they tended to disagree that their lifestyle was an impediment to buying local foods. Although they strongly agreed that seasonality was restricting their choice, they only slightly agreed that local foods were difficult to find and relatively expensive.

4. Methodology

The choices made by consumers can be described by the random utility model (Greene, 2003): the utility of option j , $j=1, \dots, J$ for respondent i , $i=1, \dots, N$ is:

$$U_{ij} = X'_{ij} \beta + \varepsilon_{ij} \quad ,$$

and the consumer chooses option j when:

$$U_j > U_k \quad , \forall j \neq k \quad ,$$

where X_{ij} is the vector of attribute levels, β is the vector of coefficients to be estimated, and ε_{ij} is the disturbance term. It is further assumed that the error terms are independently and identically distributed following a Weibull distribution. Following results by McFadden (1973), the probability $P(Y=j)$ of option j to be chosen over the others is then:

$$P(Y = j) = \frac{\exp(X'_{ij} \beta)}{\sum_{j=1}^J \exp(X'_{ij} \beta)} .$$

This probability can be used as the basis of a likelihood function which can be used for estimation.

5. Estimation & Results

Some questionnaires were discarded prior to analysis, due to missing values (respondent being vegetarian or allergic to strawberries for instance). Following an accepted technique (see, for instance, Burton and Pearse, 2002), questionnaires presenting a marked lexicographic bias have also been discarded: some individuals responded only to price, always choosing the cheapest of the three options presented to them. These people are likely to have a different utility function from the rest of the sample and have therefore been removed from our analysis, leaving us with 185 exploitable choice questionnaires for lamb, and 187 for strawberries. It is to be noted that such a bias did not significantly appear for certification attributes, due to the way the questionnaires were created: for any particular choice question, all three products could be certified or not, thus making it impossible for a respondent to always choose certified products.

As origin and season are non-linear attributes in their levels, they had to be coded as dummy variables for each of the levels but one, which is therefore implied as a reference. The GM free and organic variables are coded as 1 if the product is certified either GM free or organic, and 0 otherwise.

Statistical analysis of the conditional logit model was carried out using Limdep, different specifications being tried for each product. Normalised results for main effects only are presented in table (3).

Table (3) here

Main effects estimates have similar signs and magnitude for both lamb and strawberries, and offer generally high significance. In both cases, willingness to pay for local products is high, 88 pence per 500 grams for lamb, and 97p per 500g for strawberries, and there is a prejudice against EU imports (-53p per 500g).

Seasonality yields different results according to the product considered, with spring lamb being more valued than summer then autumn, whereas strawberries are more valued in the summer, then spring then autumn. Willingness to pay for summer strawberries is also higher (29p) than it is for spring lamb (16p); prejudice against autumn does not differ between the two however (-26p and -25p for lamb and strawberries, respectively).

There is an overall higher willingness to pay for certification in the case of strawberries, adding up to 52p against 44p for lamb; while there is a stronger preference for organic over GM free strawberries (32p vs. 20p), the preference is reversed in the case of lamb, GM free being more valued than organic (30p vs. 15p).

Further specifications including interaction terms have been estimated. Sections of the survey relating to the socio-demographic background of the respondents provided us with added information such as age, gender, etc., which could be introduced in our model as interactions with the main effects variables. Some of these variables are linear and could be used directly (e.g., age, size of the household, number of children), while others, although not strictly linear have been assumed to be (e.g., household income and weekly spending on food, which are recorded as brackets); other variables had to be modified and coded as dummy variables: education level was coded as 1 for people having attended FE college or university; dwelling was coded from the post code information as 1 for urban area. Gender was coded as 1 for male, 0 for female. For each product we report a model which has the

highest number of significant interaction terms. These results are presented in tables (4) and (5) for lamb and strawberries, respectively.

As several respondents could or would not communicate information such as their annual income for instance, the number of questionnaires available for analysis was reduced to 136 for lamb, and to 141 for strawberries.

The results show that most main effects estimates lose their significance when interaction terms are introduced in the model, some changing even sign: this may be due to a multicollinearity problem as a result of the introduction of the interaction terms.

Let us consider lamb. Concerning certification, willingness to pay for a GM free product is associated with younger, more educated and people with lower annual incomes; organic certification is associated with more educated people as well, mainly urban and having a larger weekly budget for food. Concerning the origin of the product, local is valued by older rural people with higher incomes and no children under 18; while no significant interaction term could be identified with nationally produced lamb, imports from within the EU are significantly rejected by older people. Concerning the season of production, people with a higher income are more willing to pay for spring lamb, and less willing to pay for autumn lamb; people with a higher weekly spending are more willing to pay for autumn lamb. As far as price is concerned, older people with children are more willing to pay for lamb, especially men; larger households however are not.

In relative terms, interactions involving organic or GM free certifications have the highest absolute values (*GM free*education* = 70p, *Organic*dwelling* = 43p, *Organic*education* = 38p), followed by *Local*dwelling* (-47p) and *Price*gender* (27p). The remainders, although all significant, are less important in absolute terms.

Let us consider results for strawberries. Willingness to pay for certified products, either GM free or organic, is more valued by educated people with children under 18,² and, in the case of organic, by younger people.

There is a significant willingness to pay for locally produced strawberries among older less educated people with a higher income, and, to a lesser extent, by women.³ Summer is more valued by women with a higher income

Regarding price, urban households with children and a lower income are more willing to pay for strawberries.

In relative terms and absolute values, willingness to pay is higher for certification attributes, as in the case of lamb (*Organic*education* = 70p, *GM free*education* = 50p), followed by *Price*dwelling* (48p), *Local*education* (-30p), and *Summer*gender* (-24p). The remainders are under 10 pence.

Table (4) here

Table (5) here

6. Final remarks

To a large degree, results accord with our expectations: local products are valued over imported, whilst products in season are preferred to those out of season. Certification attributes are valued positively and price is negative.

In line with our assumptions, there is a strong willingness to pay for locally produced goods: estimates for the attribute Local are positive and present the highest absolute value after Price, to the detriment of EU estimates, which present the lowest willingness to pay.

² The interaction *Organic*children* is not significant at the 10% level, although the *p*-value is very close to significance (*p* = 0.102).

³ The estimate for *Local*gender* is negative but not significant (*p* = 0.121).

Comparatively, the season of production is of little interest to respondents with much lower estimates; it appears however that, as far as lamb and strawberries are concerned, production in autumn or winter is undervalued as compared to spring and summer: as could be expected, spring lamb has the preference of respondents, while strawberries are more valued in summer.

Ethical values present a positive willingness to pay relatively more important than that of the season of production. Interestingly, while a GM free lamb is preferred to an organic one, the opposite applies to strawberries.

As far as interactions are concerned, and in line with results from the TBP part of our survey,⁴ Age appears to be characteristic of respondents who most value locally produced goods: the interaction Local*age was present in all the specifications we tried, with positive and highly significant coefficients every time. The same applies to Local*income. These hint towards a more traditional eating lifestyle, although we have no strong evidence to support this hypothesis. Other factors that could influence the willingness to pay for local products are the absence of children in the household—which could be a mere consequence of the age effect—, a lesser education level, and a rural dwelling, the latter being probably an availability constraint.

For ethical attributes Age plays a role as well, younger people being more willing to pay for GM free or organic products: this was expected, inasmuch as younger generations are commonly assumed to be more environment-conscious than their elders. A higher education level has a significant impact as well for both lamb and strawberries, which can be explained by a larger access to information educated people have. To a lesser extent, the presence of children in the household, an urban dwelling and a higher weekly budget on food have also a positive influence on the willingness to pay for product with ethical values: people who are willing to pay more on food are probably more concerned about the quality of what they—or their children— eat, and are thus ready to pay more for organic or GM free items; living in an urban area may play a positive role in the accessibility of such products too.

Income appears to be the most influential factor on the attitude towards seasonality: wealthier household are more willing to pay for products that are in season; women are more willing to pay for summer strawberries, and households spending more on food are keener to purchase lamb in autumn.

⁴ Cf. Lobb, Arnoult and Chambers (2006).

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Tables

Table 1: Attributes and levels chosen for the choice experiment.

Levels	Attributes					
	Price		Origin	Season	Type 1	Type 2
	Lamb	Strawb.				
L1	£3.99	£2.49	Local	Spring	GM free	Organic
L2	£4.49	£2.99	National	Summer	nothing stated	nothing stated
L3	£4.99	£3.49	European Union	Autumn	-	-
L4	£5.49	£3.99	Rest of the World	Winter	-	-

Table 2: Example of a choice set for lamb chop: “Please look at the choices and tell me which 500-g packet of four fresh lamb chops you would prefer to buy.”

Attributes	Choice A	Choice B	Choice C
Price	£3.99	£4.49	£4.99
Origin	Rest of the world	Local	National
Season	Summer	Autumn	Winter
Type 1		GM free	
Type 2	Organic	Organic	

Table 3: Normalised parameters estimates for main effects, for both lamb and strawberries. Log likelihood = -2169.868 (lamb); -2182.269 (strawberries).

	Lamb				Strawberries			
	Coeff.	Std Error	p-value		Coeff.	Std Error	p-value	
Price	-1.000	0.046	0.000	***	-1.000	0.046	0.000	***
Local	0.877	0.037	0.000	***	0.972	0.037	0.000	***
National	0.206	0.040	0.001	***	0.124	0.041	0.053	*
EU	-0.529	0.045	0.000	***	-0.533	0.045	0.000	***
Spring	0.157	0.039	0.009	***	0.109	0.040	0.083	*
Summer	0.065	0.041	0.302		0.291	0.040	0.000	***
Autumn	-0.258	0.043	0.000	***	-0.246	0.043	0.000	***
GM free	0.296	0.048	0.000	***	0.199	0.047	0.008	***
Organic	0.146	0.048	0.046	**	0.318	0.047	0.000	***

**Table 4: Normalised parameters estimates for main effects and interactions for lamb.
Log likelihood = -1526.350**

		Lamb		
		Coeff.	Std Error	p-value
Main effects	Price	-1.000	0.239	0.000 ***
	Local	0.287	0.198	0.169
	National	0.208	0.048	0.000 ***
	EU	0.055	0.162	0.750
	Spring	-0.082	0.092	0.401
	Summer	0.021	0.049	0.691
	Autumn	-0.250	0.147	0.107
	Organic	-0.744	0.204	0.001 ***
Interactions	Price*age	0.008	0.004	0.045 **
	Price*HH size	-0.104	0.056	0.077 *
	Price*children	0.171	0.066	0.014 **
	Price*gender	0.269	0.121	0.036 **
	GM free*age	-0.011	0.004	0.010 **
	GM free*education	0.705	0.138	0.000 ***
	GM free*income	-0.135	0.039	0.001 ***
	Organic*education	0.381	0.116	0.002 ***
	Organic*spending	0.117	0.053	0.035 **
	Organic*dwelling	0.435	0.133	0.002 ***
	Local*age	0.012	0.003	0.001 ***
	Local*children	-0.116	0.032	0.001 ***
	Local*income	0.088	0.025	0.001 ***
	Local*dwelling	-0.474	0.099	0.000 ***
	EU*age	-0.010	0.004	0.008 ***
	Spring*income	0.066	0.027	0.018 **
	Autumn*spending	0.087	0.044	0.065 *
Autumn*income	-0.067	0.030	0.035 **	

Table 5: Normalised parameters estimates for main effects and interactions for strawberries. Log likelihood = -1618.491

		Strawberries		
		Coeff.	Std Error	p-value
Main effects	Price	-1.000	0.143	0.000 ***
	Local	-0.167	0.158	0.429
	National	0.124	0.047	0.049 **
	EU	-0.434	0.051	0.000 ***
	Spring	0.028	0.047	0.652
	Summer	0.018	0.091	0.882
	Autumn	-0.152	0.049	0.020 **
	GM free	-0.128	0.084	0.256
	Organic	0.377	0.202	0.163
Interactions	Price*children	0.092	0.039	0.076 *
	Price*income	-0.098	0.032	0.021 **
	Price*dwelling	0.483	0.121	0.003 ***
	GM free*education	0.498	0.112	0.001 ***
	GM free*children	0.104	0.041	0.055 *
	Organic*age	-0.011	0.004	0.041 **
	Organic*education	0.700	0.113	0.000 ***
	Organic*children	0.092	0.042	0.102
	Local*age	0.016	0.003	0.000 ***
	Local*education	-0.304	0.098	0.020 **
	Local*income	0.137	0.029	0.000 ***
	Local*gender	-0.180	0.087	0.121
	Summer*income	0.098	0.025	0.003 ***
	Summer*gender	-0.239	0.088	0.043 **

Appendix

SECTION 2

In this part of the survey we would like to gain some insights into the choices you make when purchasing foods – the two examples given here are lamb chops and strawberries – please complete both sets of questions regardless of whether you actually purchase either of these products or not.

4. Which packet of 4 x fresh lamb chops (500g pack) would you prefer to buy?

Please choose only one in each question – circle your choice: A, B, or C.

Ref_L1

Question	Choice A	Choice B	Choice C
4-1	Produced outside the EU £3.99 Purchased in summer	Produced locally £4.49 Purchased in autumn GM free Organic	Produced nationally £4.99 Purchased in winter

Question	Choice A	Choice B	Choice C
4-2	Produced locally £3.99 Purchased in winter GM free Organic	Produced nationally £4.49 Purchased in spring	Produced in the EU £4.99 Purchased in summer GM free Organic

Question	Choice A	Choice B	Choice C
4-3	Produced nationally £5.49 Purchased in winter GM free	Produced in the EU £3.99 Purchased in spring Organic	Produced outside the EU £4.49 Purchased in summer GM free

Question	Choice A	Choice B	Choice C
4-4	Produced in the EU £5.49 Purchased in spring	Produced outside the EU £3.99 Purchased in summer GM free Organic	Produced locally £4.49 Purchased in autumn

Question	Choice A	Choice B	Choice C
4-5	Produced outside the EU £3.99 Purchased in spring	Produced locally £4.49 Purchased in summer GM free Organic	Produced nationally £4.99 Purchased in autumn

Question	Choice A	Choice B	Choice C
4-6	Produced in the EU £3.99 Purchased in autumn Organic	Produced outside the EU £4.49 Purchased in winter GM free	Produced locally £4.99 Purchased in spring Organic

Question	Choice A	Choice B	Choice C
4-7	Produced in the EU £3.99 Purchased in spring GM free Organic	Produced outside the EU £4.49 Purchased in summer	Produced locally £4.99 Purchased in autumn GM free Organic

Question	Choice A	Choice B	Choice C
4-8	Produced outside the EU £5.49 Purchased in autumn GM free Organic	Produced locally £3.99 Purchased in winter	Produced nationally £4.49 Purchased in spring GM free Organic

Question	Choice A	Choice B	Choice C
4-9	Produced nationally £3.99 Purchased in spring GM free	Produced in the EU £4.49 Purchased in summer Organic	Produced outside the EU £4.99 Purchased in autumn GM free

Question	Choice A	Choice B	Choice C
4-10	Produced outside the EU £4.49 Purchased in winter	Produced locally £4.99 Purchased in spring GM free Organic	Produced nationally £5.49 Purchased in summer

Question	Choice A	Choice B	Choice C
4-11	Produced locally £4.49 Purchased in spring Organic	Produced nationally £4.99 Purchased in summer GM free	Produced in the EU £5.49 Purchased in autumn Organic

Question	Choice A	Choice B	Choice C
4-12	Produced nationally £4.99 Purchased in summer Organic	Produced in the EU £5.49 Purchased in autumn GM free	Produced outside the EU £3.99 Purchased in winter Organic

5. Which packet of fresh strawberries (500g pack) would you prefer to buy?

Please choose only one in each question – circle your choice: A, B, or C.

Ref_S1

Question	Choice A	Choice B	Choice C
5-1	Produced nationally £2.99 Purchased in spring Organic	Produced in the EU £3.49 Purchased in summer GM free	Produced outside the EU £3.99 Purchased in autumn Organic

Question	Choice A	Choice B	Choice C
5-2	Produced outside the EU £2.49 Purchased in summer	Produced locally £2.99 Purchased in autumn GM free Organic	Produced nationally £3.49 Purchased in winter

Question	Choice A	Choice B	Choice C
5-3	Produced outside the EU £3.49 Purchased in spring GM free Organic	Produced locally £3.99 Purchased in summer	Produced nationally £2.49 Purchased in autumn GM free Organic

Question	Choice A	Choice B	Choice C
5-4	Produced locally £3.49 Purchased in autumn	Produced nationally £3.99 Purchased in winter GM free Organic	Produced in the EU £2.49 Purchased in spring

Question	Choice A	Choice B	Choice C
5-5	Produced in the EU £3.99 Purchased in spring	Produced outside the EU £2.49 Purchased in summer GM free Organic	Produced locally £2.99 Purchased in autumn

Question	Choice A	Choice B	Choice C
5-6	Produced in the EU £3.49 Purchased in winter	Produced outside the EU £3.99 Purchased in spring GM free Organic	Produced locally £2.49 Purchased in summer

Question	Choice A	Choice B	Choice C
5-7	Produced nationally £2.49 Purchased in autumn	Produced in the EU £2.99 Purchased in winter GM free Organic	Produced outside the EU £3.49 Purchased in spring

Question	Choice A	Choice B	Choice C
5-8	Produced in the EU £2.49 Purchased in autumn Organic	Produced outside the EU £2.99 Purchased in winter GM free	Produced locally £3.49 Purchased in spring Organic

Question	Choice A	Choice B	Choice C
5-9	Produced locally £2.49 Purchased in spring	Produced nationally £2.99 Purchased in summer GM free Organic	Produced in the EU £3.49 Purchased in autumn

Question	Choice A	Choice B	Choice C
5-10	Produced in the EU £2.99 Purchased in summer GM free	Produced outside the EU £3.49 Purchased in autumn Organic	Produced locally £3.99 Purchased in winter GM free

Question	Choice A	Choice B	Choice C
5-11	Produced locally £2.49 Purchased in summer GM free	Produced nationally £2.99 Purchased in autumn Organic	Produced in the EU £3.49 Purchased in winter GM free

Question	Choice A	Choice B	Choice C
5-12	Produced locally £3.99 Purchased in summer Organic	Produced nationally £2.49 Purchased in autumn GM free	Produced in the EU £2.99 Purchased in winter Organic

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