Who cares about food origin?

A comparison of hypothetical survey responses and actual shopping behavior

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In the food product space, labels have moved well beyond merely providing information about ingredients and nutritional content to include a host of information of interest to consumers including production related attributes such as: origin of production, farm size, producer and labor welfare (e.g., fair trade), organic, water usage, and carbon. In part, the proliferation of such a variety of labels reflects both the abundance of credence and experience attributes among food products that are of importance and value to consumers as well as the efforts of producers to differentiate their products in a crowded marketplace. Product labels such as these are a key point of sale mechanism to communicate both desirable and undesirable product attributes (e.g., genetically modified) and to facilitate informed product choices by consumers. In the presence of asymmetric information regarding product characteristics, credible labels are critical for enabling producers to signal product quality attributes of value to consumers. Credible labels can avoid the market failures associated with Akerlof's lemons problem (1970) and allow the emergence of a market for higher quality goods resulting in equilibria with superior welfare properties.

Given the importance of food labeling to consumers and producers alike, an extensive literature has emerged evaluating consumers' preferences towards, and willingness to pay for, existing and new attributes that can be signaled through food labels and serve to differentiate products. One particular product attribute that has recently received extensive attention in the agricultural economics literature is origin of production. Origin of production labels encompass a variety of different designations such as country-of-origin (COO), region-of-origin (ROO),

geographical indication (GI), and locally grown. Interest in investigating consumers' preferences and willingness to pay for origin labeled products, and in particular country of origin labels (COOL), has in part been invigorated with the passing of several new mandatory labeling laws (e.g., the 2002 and 2008 US Farm Bills) and an emerging view that origin labeling can be an effective mechanism for producers to differentiate their products.

Researchers, given the absence or lacking nature of market level data on sales of origin labeled foods, have employed numerous experimental methods for eliciting consumer demand and preferences for origin labels. These methods span the spectrum from surveys (e.g., Davidson, Schroder, and Bower 2003; Glitsch 2000, Hoffmann 2000; Roosen, Lusk, and Fox 2003), choice experiments (e.g., Chung, Boyer, and Han 2009; Dransfield et al. 2005; Loureiro and Umberger, 2007; Tonsor et al. 2005), and experimental auctions (e.g., Alfnes and Rickertsen 2003; Feuz et al. 2004; Umberger et al. 2003). For the most part, researchers using these methods have found that on average consumers are willing to pay a substantial premium for foods originating from specific origins (e.g., domestic beef). However, while most experimental studies find that consumers prefer and are willing to pay a premium for many foods with COOL, the premium varies substantially across studies, products, countries, experimental methods, etc. For example, Ehmke (2005) finds that Nigerian consumers are willing to pay a 153% premium for COOL onions while Tonsor et al. (2005) find in a non-hypothetical choice experiment that German consumers discount domestically labeled beef steaks 55.4%.

Yet, while there is extensive experimental evidence that consumers prefer origin labels for food products, the authors are unaware of previous studies that have attempted to evaluate if the predictions found through experimental methods translate into real world consumer behavior. In other words, if those preferences are reflected in shopping behavior in that consumers are

actively searching for and utilizing origin information to make product purchase decisions. In fact, in aggregate beyond the topic of origin labeling, the literature comparing findings in food experiments with real-world consumer behavior and market outcomes is surprisingly small (see Brookshire, Coursey, and Schulze 1987; Chang, Lusk, and Norwood 2009; Lusk, Pruit, and Norwood 2006; Shogren et al. 1999).

While many of the above listed experimental methods are theoretically incentive compatible, there are well understood reasons to question how appropriate they are in capturing and predicting consumer behavior outside of the experiment. One common detractor across each of these preference elicitation methods is that they clearly do not mimic the market environment and decision process in which consumers typically engage and transact. Even experimental auctions, which arguably have the most similarities with typical market transactions (e.g., auctions involve direct financial consequences to decisions), involves a market situation dissimilar to a typical trip to the grocery store. Furthermore, by nature, none of these methods are able to capture the confounding factor of the actual location of purchase.[1] A second complication is that the very nature of the products and labels presented to consumers in preference experiments are typically different than those found in the marketplace. Food labels or attribute descriptions presented to consumers in preference experiments are typically designed by the researcher to explicitly highlight the component(s) of interest to the researcher while stripping away other information (e.g., brands) and potentially confounding factors (e.g., designer packaging, advertising, location on the shelf, opportunity costs for reading labels, etc.)

[1] For example, over time stores might be able to accumulate reputation for selling quality products. It is reasonable to expect the *additional* willingness to pay for the presence of a quality cue in a store with reputation for high quality to be smaller than that emerging in a faceless experimental setting for the very same quality cue. In other words, the store reputation might work as a substitute for other quality cues (e.g., a trusted butcher shop), for which the actual willingness to pay might be overestimated in experimental settings.

that are not the focus of the researcher's study. For example, Noussair, Robin, and Ruffieux (2002) in an experimental auction setting find that, despite a significant aversion to genetically modified (GM) foods, consumers were willing to pay equivalent amounts for food with and without GM ingredients unless the researchers overtly emphasized the fact that there were GM ingredients in one of the food products (i.e., consumers simply did not read the labels).

Using data from a "field" interview of 702 pork purchasers conducted at the point of sale in a variety of food retailers, we explore whether origin labeling is as relevant to consumers as previous studies (and our own survey) indicate. Participants engaged in both a hypothetical survey eliciting evaluations of the importance of different pork attributes (e.g., country of origin, price, color) and a series of questions related to their knowledge about the attributes of their actual purchase of pork made during their shopping trip; thus permitting a comparison of hypothetical responses with actual purchase behavior. By conducting both the hypothetical survey and the pork purchase survey with the same individuals concurrently at the time of consumer's actual decision in a market situation we are able to avoid several potential stumbling blocks when comparing hypothetical and actual consumer behavior. Our primary findings are threefold: (1) in agreement with previous studies we find that COOL is a highly relevant attribute to a subset of consumers, (2) a share of consumers does pay attention to origin labels and is willing to undertake costly search for origin information even if it is not present on the label/display, and (3) there is a strong degree of agreement between hypothetical survey responses and actual shopping behavior. This latter finding has practical implications because it instills confidence in the outcomes and prescriptions emerging from economic valuation through experimental methods for industry practitioners as well as policy makers.

The remainder of the article is as follows. In the following section an overview of the data collection procedure is provided. The next section presents a summary of consumers' responses. Econometric analysis of the relationship between hypothetical responses and actual behavior are provided in the following section. Finally, we conclude.

Design of the Study

Data on consumers' preferences and pork purchases was solicited via a questionnaire-based face-to-face interview conducted at five different food retailers in Northern Germany. In order to obtain a representative sample of consumers, interviews were conducted at: (1) a large supermarket in the center of a major city, (2) a smaller neighborhood supermarket on the periphery of the city, (3) a discounter, (4) a hypermarket, and (5) a butcher shop. Interviews were conducted over the course of 7 days during different shopping hours in order to capture different consumer segments.

Customers at the retailers were asked, after completing their purchases, if they had purchased pork during their shopping trips. Customers who responded affirmatively were asked to participate in a research project on shopping behavior. A total of 702 individuals agreed to participate, completed the full interview process which lasted approximately 15 minutes, and yielded complete responses to the survey questions. Summary statistics for the socio-demographics of the sample are presented in table 1.

[Insert Table 1 about here]

Over the course of the interview participants were asked questions on a variety of topics including (1) their attitudes towards pork and pork attributes, (2) the attributes of the pork they had just purchased, (3) their history and habits when shopping for pork, (4) and socio-

demographic information. By comparing stated attitudes towards pork attributes with the consumers' actual purchase behavior, we are able to contrast hypothetical survey methods with actual market behavior.

To obtain a baseline measure of consumer attitudes towards the importance of origin labeling for food, consumers were asked to assess a list of attributes based upon their importance when purchasing pork. The list of attributes included: (1) brand, (2) color, (3) humane animal treatment, (4) controlled production ("Kennzeichnung einer kontrollierten Produktion"), (5) origin, (6) price, (7) shelf life, and (8) visible fat content.

Then, to contrast these responses with their actual pork purchase, consumers were asked several questions about their knowledge of the origin of their pork selection. First, consumers were asked if they knew the origin of their purchased pork (country, state, area, specific producer, etc.). To avoid potential "yea-saying" behavior, participants were then asked specifically where the pork originated and verified based upon their actual purchase. Finally, participants were asked the source of their information about the pork's origin (e.g., label, sales personnel, etc.).

Before presenting an analysis of consumer responses, there are a couple of aspects regarding the data collection procedure that are important to note since they differ from previous studies. First, unlike other studies addressing origin labeling that have used random samples from the population (either via a mail survey or in person experiment), we limited ourselves only to actual purchasers of the product in question. In addition to facilitating the analysis of actual purchase decisions, it ensures that our results are not confounded by responses from non-consumers or unlikely consumers of the products in question.

Second, when consumers were asked about the origin of their purchased pork, we did not explicitly limit responses to the country of origin. Any origin response was invited. Allowing more general responses enables us to capture any origination characteristic of the product that may have entered into the consumers' minds when selecting their product. If the findings of previous studies focusing explicitly on COOL translate from an experimental setting to a real world environment, we would expect to find that the more encompassing category of "origin" to be even more relevant to consumers.

Third, by asking consumers specifically about their knowledge of their purchased pork's origin, we are able to capture valuable information not directly assessable from market level data. Specifically, we are able to assess whether the consumer in fact knew the origin of their product, and hence was able to factor this information into their decision making process, not simply whether they did indeed purchase pork from a specific origin of pork bearing a specific origin label. This distinction is critical for assessing consumer preferences and additional willingness to pay for origin.

Summary of Survey Responses

Table 2 presents summary statistics for the hypothetical survey component of the study focusing on the relative importance of eight key pork attributes. The percentage of surveyed pork shoppers who selected each attribute as the most, second most, and least important is presented. Price (29.9%) and shelf life (15.5%) were the two most commonly cited attributes as being the most important factor when purchasing pork. Origin was the third highest ranked attribute (14.4%) ahead of two intrinsic quality cues (color and visible fat content), two production related attributes (controlled production and humane animal treatment), and brands.

An additional 7.4% of individuals cited country of origin as being the second most important factor, yielding approximately 22% of the sample indicating that country of origin is highly relevant when shopping and purchasing pork.[2] However, countering these individuals, a nearly equivalent share (12.5%), the second largest share overall, stated that COO was the least important attribute when shopping for pork, thus indicating that there is heterogeneity among consumer attitudes towards origin.

[Insert Table 2 about here]

If our survey, and the many previous experiments addressing consumers' attitudes and WTP for COOL, are consistent with and capturing actual consumer behavior we would expect to find that a significant share of consumers are utilizing origin labels when selecting among different pork alternatives in an actual real-world purchase situation. Explicitly, we would expect that those individuals, who indicate in a hypothetical or non-market situation that they value and rely upon origin labeling, exhibit this behavior in the market place. To test the validity and relationship between hypothetical responses and actual purchasing behavior, the second part of our interview of pork purchasers asked specific questions about their current trip to the food retailer and their actual pork purchase.

[2] While the finding that COO is highly relevant to 22% of individuals appears to be in line with other findings in the literature, it is difficult to make a direct comparison due to the topical and methodological differences across the many studies of COO. For example, the closest hypothetical survey to ours, Roosen, Lusk, and Fox (2003), found that COO was the most important attribute whereas we found that it was the third most important. Hypothesizing as to why a relative ranking discrepancy was found is problematic given the host of differences across the studies including product focus (pork vs. beef), methodology (most-least rating vs. Likert scale ranking), sample composition (in-store interview of pork purchasers vs. random mail survey), and the inclusion of two additional attributes (humane treatment and controlled production) which may be correlated with origin.

Across the entire sample, almost a third (30.5%) indicated that they had utilized origin information when shopping for pork and were able to identify the origin of the pork they had just purchased.[3] This indicates that origin information is incorporated into the decision process by a significant share of shoppers during a typical market situation. To test the correspondence between hypothetical survey responses and purchasing behavior, table 3 presents the percentage of individuals that were aware of the origin of their pork based upon survey responses. A stark difference is found between individuals who cited that origin was the most important attribute, least important, and ratings in between. Of those who ranked origin as the least important attribute when making pork purchase decisions, only 15.9% knew the origin of their pork while 68.3% of those who stated that origin was the most important attribute (64.1% for second most raters) identified the origin of their pork purchase. To help frame this percentage, consider that in a subsequent interview question 61.0% of individuals who stated that price was the most important factor when shopping for pork were able to recall and identify at least approximately the price of their pork without relying upon the receipt.

Finally, table 4 presents responses to an open-ended question asking the pork purchasers, who were able to identify the origin of their pork, the source of their information. The responses were classified into four major categories: (1) Product label, (2) Store display, (3) Store personnel (i.e., verbal statements of the origin), and (4) Other responses. Again, we find a significant difference between those who rated origin as being most and least important. The majority of individuals who stated that origin was the least important attribute had acquired their information via a store display (57.1%) and none of them had sought information through store

[3] To avoid inclusion of "yea-sayers", of individuals who responded affirmatively to having used and knowing the origin of their purchased pork, but were unable to identify the location in a follow-up question, were excluded from this measure (approximately one percent).

personnel (0.00%). A different picture emerges for their counterparts who rated origin as most important. Compared to the former group, these consumers were relatively more likely to have acquired their information via either product labels (42.4% vs. 28.6%) or store personnel (30.5% vs. 0.00%). Individuals with ratings in between, fit in an intermediate position compared to the former two groups. This pattern fits with intuition that individuals who value the attribute origin not only are overall more likely to know the product origin (as suggested in table 3), but are also more likely to undertake the additional effort (i.e. search or informational cost) to acquire the information, whether it be conversing with store personnel or reading food labels. Additionally, this tends to further support the conclusion that there is a correspondence between the hypothetical responses and actual shopping behavior.

Econometric Model of Responses

To further assess the relationship between hypothetical survey responses, utilization and knowledge of product origin, and the source of origin information, in this section we present estimates from two econometric models. Table 5 presents estimates from a probit model where the binary variable, "Origin", constitutes the dependent variable taking a value of 1 if the respondent had used and knew the origin of their actual pork purchase. Explanatory variables include (a) several socio-demographic variables that would be hypothesized to be related to the utilization of origin attributes when shopping (e.g., education and income), (b) two dummy variables to control for historical behavior and potential product familiarity when shopping for pork: "Regular Pork Purchaser" and "Exclusively Purchase Pork at the Store", (c) the location in the store where the pork was obtained (whether from the meat display "counter" or from a pre-packaged meat section (a cooler or freezer), and (d) two characteristics of the actual pork purchase (expenditure and whether the pork was on sale or advertised). Finally, we also include

dummy variables for the hypothetical survey responses to assess the relationship with actual purchase behavior.

Coefficient estimates of the probit model of consumer's utilization of origin labels (table 5) fall partially in line with expectations. Older customers and those with greater expenditures on pork were more likely to use origin labels while shopping. However, no statistically significant relationship was found between income, education, or pork shopping patterns with origin information usage. Most critically, individuals who rated origin in the hypothetical survey as the most or second most important attribute when selecting pork were much more likely to have utilized origin labels when making their purchase (coefficient estimate, 1.05, marginal effect, 0.40). This reinforces the unconditional analysis presented earlier providing further statistical evidence that there is a correspondence between hypothetical survey responses and actual market decision behavior.

Table 6 presents estimates of a multinomial logit model of how consumers acquired their information regarding the origin of their purchased pork product. The categorical responses for information source, as detailed in table 4, include "Product label", "Store Display", and "Store Personnel", and "Other Sources" capturing responses not fitting into the three dominant categories. *A priori* we hypothesize that individuals who are more concerned with and place a greater value on the origin of their pork would be more willing to undertake costly search activities to acquire this information, i.e., they would be more likely to ask store personnel or to read a product label. We hypothesize that store displays, which are likely the most obvious source of information, would be relatively less likely. Coefficient estimates of the multinomial logit model of consumers' source of origin information yields few statistically significant variables explaining consumers' information source. However, in agreement with expectations,

individuals who rated origin as the most or second most important attribute when purchasing pork where relatively more likely to acquire their information via product labels or store personnel than individuals who did not rate origin as being one of the most critical attributes when purchasing pork. Again, this provides further evidence that the hypothetical survey responses do translate into consumers undertaking costly search activities to acquire the professed valuable information.

Discussion

In contrast to the previous experimental studies of consumer preferences for country of origin labeled products, this study has investigated consumer utilization of origin information in actual purchase situations, thus allowing a comparison of experimental methods with consumer behavior in the marketplace. Specifically, our methodology of interviewing consumers regarding their market purchases has allowed us to investigate the specific information consumers sought and possessed when optimizing over potential products, not merely that they purchased a product with a specific origin attribute without any knowledge of the attribute or specific intent.

From a practitioner's perspective utilizing experimental methods, the findings of the analysis are largely positive with some important caveats. We find that indeed there is a strong correspondence between stated preferences for origin labeled products in a hypothetical survey with consumers' actual behavior in the market. Given widespread reliance on a host of non-market methodologies for assessing consumer preferences, this is admittedly a comforting result and contributes to the small but growing literature comparing experimental findings with market outcomes. As well, specifically in terms of the importance of origin to consumers, our survey of

pork purchasers indicates that indeed origin is a relevant factor for a significant share of consumers when evaluating products; thus providing market evidence for the findings of previous studies assessing demand for origin labeling. However, while our findings tend to support the existing literature on origin, it is abundantly clear that there is not a perfect relationship between hypothetical and market behavior among consumers. A full third of consumers who stated that origin was the most important factor when making a selection of pork was not aware of the origin of their product. This finding highlights the need for future research of underlying motives of a) utilizing origin labeling when making purchase decisions and from a methodological view point b) analyzing consumer response behavior to lower the bias of results from hypothetical surveys.

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Table 1. Sample Characteristics

Variable Category	Variable	Mean	Stdev.
Socio-Demographic Information	Age	45.69	17.06
	Education (years of schooling)	11.70	2.62
	Gender	0.61	0.49
	Household Size	2.35	1.16
	Net Income (in Euro per month)	1440.16	791.04
Historical Pork Purchasing Habits	Exclusively Purchase Pork at the Store	0.25	0.43
	Regular Pork Purchaser	0.65	0.48
Pork Purchase Characteristics	Pork on Sale or Advertised	0.12	0.32
	Pork Expenditure (in Euro)	5.49	6.68
Where Pork was Selected in Store	Cooler or Freezer	0.51	0.50
	Counter	0.49	0.50
Type of Retailer	Butcher	0.03	0.18
	Discounter	0.16	0.36
	Hypermarket	0.42	0.49
	Supermarket	0.39	0.49

Table 2. Pork Attribute Ratings

Attribute	Level of Importance		
	Most	Second Most	Least
Brand	0.7%	2.0%	35.6%
Color	11.0%	15.0%	5.8%
Humane animal treatment	3.8%	3.3%	10.4%
Official label of Controlled Production	10.0%	10.5%	5.8%
Origin	14.4%	7.4%	12.5%
Price	29.9%	21.1%	11.3%
Shelf Life	15.5%	18.1%	8.0%
Visible Fat Content	13.4%	21.1%	4.3%
Other	1.3%	1.6%	6.3%

Table 3. Percentage of Individuals who Knew the Origin of their Pork Purchase

Rating of Origin Importance	Percentage who Knew Pork Origin
Most Important	68.3%
Second Most Important	64.1%
Least Important	15.9%
Other	19.7%
Entire Sample	30.5%

Table 4. Source of Origin Information

Source of Information	Rating of the Importance of Origin		
	Most or Second Most	Other	Least
Product Label	42.4%	38.7%	28.6%
Store Display	13.6%	22.6%	57.1%
Store Personnel	30.5%	14.5%	0.00%
Other	13.5%	24.2%	14.3%

Table 5. Estimates of Probit Model of Consumers' Utilization of Origin Labels

Variable	Coef.	Std. Err.
Age	0.007**	0.004
Education	0.022	0.023
Gender	0.102	0.114
Household Size	0.047	0.050
Income	0.000	0.000
Counter	0.085	0.111
Exclusively Purchase Pork at the Store	-0.052	0.128
Regular Pork Purchaser	-0.057	0.115
Pork on Sale / Advertised	-0.139	0.096
Pork Expenditure	0.015*	0.008
Origin - Most or 2nd Most Important	1.089***	0.128
Origin - Least Important	-0.262	0.177
Constant	-1.629***	0.399
Log-likelihood	-360.91	
LR Statistic	105.04***	

*, **, and *** denote variable significant at 10%, 5%, and 1% respectively.

Table 6. Estimates of Multinomial Logit Model of Consumers' Source of Origin Information

Variable	Product Label	Store Personnel	Other Source
Age	-0.044	-0.018	-0.007
	(0.021)	(0.023)	(0.022)
Education	-0.020	0.012	-0.107
	(0.123)	(0.121)	(0.133)
Gender	-0.538	-0.745	-0.422
	(0.656)	(0.685)	(0.670)
Household Size	-0.560	-0.244	-0.240
	(0.255)	(0.259)	(0.273)
Income	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Counter	-1.686	1.046	-0.651
	(0.634)	(0.811)	(0.683)
Exclusively Purchase Pork at the Store	-0.193	-0.022	0.552
	(0.768)	(0.715)	(0.715)
Regular Pork Purchaser	-0.781	0.251	-0.106
	(0.605)	(0.678)	(0.659)
Pork on Sale / Advertised	1.239	0.537	-0.970
	(0.904)	(0.956)	(1.277)
Pork Expenditure	0.018	0.010	0.035
	(0.062)	(0.064)	(0.056)
Origin - Most or 2nd Most Important	1.401**	1.640**	0.341
	(0.626)	(0.646)	(0.673)
Constant	5.523	-0.018	3.166
	(2.339)	(2.410)	(2.565)
Log-likelihood	-134.40		
LR Statistic	72.34***		

*, **, and *** denote variable significant at 10%, 5%, and 1% respectively. Standard deviations in parenthesis.