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TRACEABILITY AND COUNTRY OF ORIGIN LABELLING

INTRODUCTION

Country of origin labelling (COOL) on food products is controversial. There is disagreement over whether consumers value information on country of origin intrinsically or as a quality or a safety signal. The debate becomes more heated when country of origin labelling is mandated by regulation, with fears that the regulation is driven by producer rather than consumer interests. Country of origin labelling has implications for traceability systems in agrifood supply chains. The ability to provide consumers with information on the country of origin requires a basic level of traceability, although does not necessarily imply full traceability throughout the supply chain to the farm. This paper examines the role of traceability and identity preservation systems in marketing agrifood products, focusing on the underlying economic functions of traceability systems. Voluntary versus mandatory labelling of country of origin and/or traceability becomes a question of determining if consumers value this information and whether a market failure exists in providing this information. The trade implications of mandatory country of origin labelling are explored within this context.

Country of Origin Labelling

Producer interest groups in various countries have often lobbied for the introduction of country of origin labelling on food. Usually this lobbying is predicated on the assumption that domestic consumers will prefer domestically produced food, either due to perceived quality or safety differences or through an ethnocentric desire to support domestic industries. In the US, country of origin labelling has been brought before Congress on numerous occasions but it was not until the 2002 US Farm Bill that COOL became enshrined in law through an amendment to the Agricultural Marketing Act. The COOL provisions of the 2002 Farm Bill cover a range of

commodities including beef, lamb, pork, fish, fresh and frozen fruits and vegetables and peanuts. Notably, chicken is excluded. The regulations requiring mandatory retail level country of origin labelling are to be in place by September 30 2004; in the interim, COOL is voluntary. Food service is exempt from these regulations. To receive a US country of origin designation livestock must be born, raised and slaughtered in the United States. If some production processes occur in another country, labels will also have to indicate this. For example, cattle raised in Canada prior to being imported for slaughter in the US would be labelled "From cattle imported from Canada. Processed in the US".

The US COOL provisions provoked consternation in the Canadian livestock sector, with fears that Canadian beef would be discounted 10-20% in the US market and industry estimates of a 5-20% decrease in live cattle prices (Thomas, 2002). This fear is two-fold. First, that US consumers will react negatively to products that are not identified as "US". Second, that mandatory regulations will impose significant supply chain segregation costs on processors, deterring the use of Canadian products. Thus a packer usually sourcing cattle from both Canada and the US could be deterred from using Canadian cattle due to the need to label the Canadian origin – or mixed origin – at the retail level. Similarly, retailers may prefer to source their products just from the US to avoid additional supply chain costs from identifying US versus non-US products. In the livestock sector, COOL will likely have a disproportionately large – and more immediate – impact on imports of live animals or products for further processing in the US.

Some US States introduced mandatory country of origin labelling prior to the national legislation. The Louisiana Legislature passed legislation requiring all fresh meats to be labelled as imported or "American" at the retail store; the law was implemented in July 2001. Florida and

Maine have required mandatory country of origin labelling for fresh produce since the 1980s (Schupp and Gillespie, 2001).

Consumer research has indicated a stated preference among consumers for country of origin information, although the literature is divided as to whether consumers are willing to pay more for identifiable domestic produce. Schupp and Gillespie (2001) report that between 88 and 92 percent Louisiana households that were surveyed indicated a support of mandatory country of origin labelling. The reasons were preferences for domestic products or perceived safety differences between domestic and imported beef. Their research did not gauge consumers' willingness to pay for this information. Louriero and Umberger (2002) used contingent valuation to estimate potential premiums for US Certified steak and hamburger in the range of 52 to 110 percent among consumers sampled in Colorado, although they caution that these estimates may be subject to a degree of selection bias. Their research also revealed that quality variables such as freshness, leanness, high quality, tenderness, as well as food safety, tended to be more important to consumers than knowing who produced the product or than buying locally raised beef. Consumers who said they were more concerned about food safety and quality also gave a higher stated willingness to pay for certified US steak. This suggests that some consumers may use country of origin labels as a quality or safety cue.

Hoffman (2000) reports a preference among Swedish consumers for country of origin labelling identifying Swedish meat products. He found that consumers used this information as both a safety and a quality cue due to specific characteristics of Swedish meat production, including an emphasis on animal welfare, a prohibition on antibiotics and a unique salmonella control program. In contrast, Grunert (1997) concluded that country of origin information, as well as information on production processes did not affect consumers' perception of quality in

France, Germany, Spain and the UK. Grier et al (2002) suggest US retailers believe that US consumers do not care about country of origin, the information is of no value and that even given mandatory COOL they will continue to source pork products from Canada if their costs do not increase substantially.

Evidence on the value of country of origin labelling to consumers is decidedly mixed. Many studies show a consumer interest in country of origin information but are unclear as to whether it is knowledge of origin that is valued for ethnocentric or ethical reasons, or whether consumers link country of origin to perceptions about quality and food safety. If the latter is true then country of origin labelling is subject to measurement error as it is a proxy measure of value. The next section explores this idea further, drawing on literature from the economics of information and quality measurement.

INFORMATION ASYMMETRY AND QUALITY SIGNALS

Food safety and food quality issues have become increasingly important in consumer perceptions of food markets. Food quality comprises a complex array of factors. Consumers use quality indicators or "quality cues" to evaluate product quality. Intrinsic quality attributes are inherent in the physical product and include for example, fat content, tenderness, marbling and colour. Extrinsic quality cues may include brand name, price, and country of origin (Hoffman, 2000). Some quality attributes are search attributes that are observable to the consumer prior to purchase. Experience attributes can only be evaluated after consumption. Some food safety problems (e.g. immediate illness following consumption of food contaminated with salmonella) are experience attributes, as are many quality attributes such as tenderness in a meat product or juiciness in an orange. Many food safety and quality attributes, however, are credence attributes, such as product origin, the animal welfare or environmental practices used on the farm or the

presence of genetically modified organisms. Country of origin labelling identifies a credence attribute.

Consumers incur information costs in determining whether an experience or credence attribute may be present. Market failure can arise as a result of information asymmetry if the market adversely selects lower quality (or unsafe) food in the absence of information signals to consumers. Grossman (1981) argues that the market has a self-correcting mechanism if quality disclosure is costless. Sellers of high quality products have an incentive to disclose quality. Therefore, non-disclosure implies low quality. This self-correcting mechanism hinges on the ability to (costlessly) verify product quality disclosures ex post. McCluskey (2000) shows that profit-maximizing producers can gain from deceiving consumers with false quality claims. Repeat-purchase relationships and third party monitoring are necessary for efficient markets in high quality credence goods. Efficient markets in credence goods require credible product quality signals. Traceability systems facilitate the provision of quality signals to consumers. However, many of the emerging traceability systems for food products are unlikely to provide credible ex ante quality signals to consumers.

Traceability systems may identify specific credence attributes that relate to perceived food safety issues, such as enhanced food safety practices on the farm or in the processing plant. Alternatively, they may identify credence attributes with respect to the reduction of environmental externalities or those related to ethical preferences with respect to animal welfare.

For some consumers, country of origin may be an ethical preference, similar to animal welfare, but it may instead be used as a proxy measure for quality and safety. Barzel (1982) argues that proxy measures of value can lead to measurement errors and a divergence between the price of a product and its valuation by the consumer. If buyers incur high measurement costs,

the net price they are willing to pay for the product (posted price net of the costs of measurement) is reduced. It is usually in the seller's interest to incur product quality measurement costs to reduce the incentive for costly sorting activities by multiple buyers. Barzel concludes that institutions arise to reduce the costs of measurement.

> The problems and costs of measurement pervade and significantly affect all economic transactions. Errors of measurement are too costly to eliminate entirely. The value of equally priced items will differ, then, and people will spend resources to acquire the difference. Such resource expenditure is wasteful, and it is hypothesized that exchange parties will form such contracts and engage in such activities that reduce this kind of resource use (Barzel, 1982, p.48).

Mechanisms to reduce measurement costs through credible quality signals include firm-level strategies such as branding and product warranties. Industry-wide initiatives include commodity grading schemes, quality assurance and certification systems – usually with third party verification to strengthen the credibility of the quality signal. It is more efficient for firms or industries to signal quality directly to consumers through quality verification institutions rather than using an assurance of origin, such as a country of origin label or a traceability guarantee, as an indirect quality signal.

Voluntary labelling by firms, sometimes supplemented by third party certification, can be used to identify credence attributes. If there is a market premium for 'safer' food, there is an incentive for firms with high food safety standards to identify this attribute in a label. A credible monitoring and enforcement mechanism is necessary to reduce the risk of cheating through mislabelling. A self-policing industry quality assurance or safety labelling program could be effective if those firms producing 'high quality' (or demonstrably safer) food are able to censure those firms who free-ride on the certification program through false or misleading labelling. In the absence of an effective self-policing mechanism the market failure problem persists for

products with negative quality or safety attributes. A firm will not voluntarily disclose low quality.

There are numerous examples of traceability and quality verification systems in the agri-food sector, some of which provide direct quality or safety assurances, while others provide only a traceback or origin assurance, which may be a poor proxy of actual quality or safety. The next section discusses some examples of both private sector and mandatory traceability labelling programs. The discussion focuses on livestock traceability programs, although many of the concepts are applicable to other commodities.

LIVESTOCK TRACEABILITY

Private Sector Initiatives

Private sector traceability systems in the livestock sector include individual supply chain initiatives and industry-wide programs. Supply chain partnerships delivering traceability have emerged in the UK beef industry, largely as a result of the loss in consumer confidence following the Bovine Spongiform Encephalopathy (BSE) crisis. Tracesafe, a small farmer-owned UK company, has developed a network of cattle breeders and finishers who rear cattle to specific production guidelines. The production protocols specify the purchase of feed from a set of contracted feed mills and include an extensive system of on-farm record keeping. Tracesafe differentiates its beef on the basis of its ability to trace the history of individual meat cuts to the animal of origin, with an implied safety assurance. The beef is sold in specialist retail outlets and restaurants under the Tracesafe brand name (Fearne, 1998).

The VanDrie Group in the Netherlands produces veal in a closely coordinated system. The VanDrie Group is vertically integrated through feed manufacturing and processing, with

calves reared on independent farms through production contracts. The product is traceable from the retail shelf to the farm of origin, with additional information provided on production methods used on the farms (Buhr, 2002).

Elements of the Canadian meat processing sector have recognized the potential role of traceability in bolstering consumer confidence in food safety, and as a product differentiation strategy. Michael McCain, President and CEO of Maple Leaf Foods Inc. recently referred to traceability as the "holy grail of the food supply chain". Maple Leaf is currently funding the development of DNA identification technology to facilitate the traceback of meat to the farm of origin (Powell, 2002). Pressure from export markets, particularly the Japanese market, appears to be a significant driver for this development.

In other cases, private sector traceability initiatives are a result of pressure from downstream food retailers. This is motivated by a desire to reduce risk exposure or to reduce the transaction costs of monitoring product quality or downstream production methods. However, this does not necessarily mean that traceability information is made available to consumers on retail packages. UK supermarkets require their beef suppliers to be members of accredited quality assurance programs. While traceability back to the farm may not be an explicit requirement, it can be a necessary condition for providing information on production and processing methods (Hobbs, 1996; Fearne, 1998).

Industry associations or producer groups have also introduced industry-wide private sector traceability programs. The Canadian Cattle Identification Agency (CCIA) was established by the Canadian Cattlemen's Association and has implemented a national cattle identification system to facilitate the traceback of cattle in the event of a food safety problem. The industry initiated CCIA as a risk reduction strategy. Prior to the introduction of the traceback system, the

identification and tracing of animals in the event of a major crisis on the scale of BSE would have been virtually impossible.

Cattle leaving the herd of origin are issued a unique ID number displayed on a CCIA tag with a barcode. Tags are distributed by authorized service centres that record which ID numbers are allocated to which producers. The unique ID number is maintained to the point of carcass inspection in the packing plant. Monetary penalties for non-compliance can be imposed on producers. In the event of a food safety problem, the Canadian Food Inspection Agency (CFIA) initiates a traceback procedure using information from the CCIA database to identify the last location of the animal and the herd of origin (CCIA, 2002). This information is used to track cattle movements both backwards and forwards in the supply chain. Producers are not required to maintain records. In this regard the Canadian system is quite different from the 'cattle passport' system in the UK. The UK system requires producers to register all cattle movements on or off a farm with the national identification agency. In the UK, the unique animal ID number should allow immediate identification of all farms on which the cattle have been located. The Canadian system only allows identification of the herd of origin and the final location of the cattle, with traceback beyond those two points relying on the ability of producers to provide this information.

The Australian beef industry has a voluntary quality assurance system that includes a national identification program including DNA sampling for traceback. The Australian system is billed as an industry-government partnership, and is led by a government agency, the Meat and Livestock Agency (MLA). A series of quality management protocols covering production, handling and processing were developed under the umbrella of "Cattle Care". A producer selling cattle signs a National Vendor Declaration form that identifies the seller and provides

basic production information (e.g. whether the cattle were treated with a growth-promoting hormone, information about the feeding program, etc). This information, combined with a cattle tag, enables the traceback of cattle in the event of a problem (Lawrence, 2002).

A voluntary grading system, Meat Standards Australia (MSA), uses a series of pre and post-slaughter measures to predict the eating quality of meat. Blood samples are taken from each carcass that qualifies for the MSA program while the carcass can still be identified with a seller. If a consumer complains of a bad eating experience from MSA-graded meat, a DNA sample from the meat can be matched with the blood sample from the carcass. In this way, meat cuts can be traced through the supply chain and to the farm of origin. The traceback in the MSA system is focused primarily on quality rather than just food safety. It provides a direct link between eating quality and production and processing methods. It can assist in identifying where improvements may be necessary or in identifying sellers who consistently misrepresent cattle on their National Vendor Declaration form (Lawrence, 2002).

The Australian systems of identification and quality assurance are voluntary. They establish the information infrastructure onto which individual supply chains can bolt on their own quality branded beef programs. There are several examples of Australian branded beef programs that use the MSA system as part of a product differentiation strategy (Lawrence, 2002).

Regulatory Initiatives

Mandatory traceability and labelling initiatives have been introduced in some countries. The European Union (EU) beef labelling regulation requires all Member States to introduce compulsory beef labelling and traceability systems. There are three components to the regulation. First, each Member State will have a national cattle identification and registration system. Second, beef products will be labelled with a traceability number identifying origin, including

where the animals from which the meat was derived were born, reared, slaughtered and processed. Third, the regulation introduces rules for voluntary labelling with additional information (for example, production information, animal welfare information, etc.).

In Canada, the Agricultural Policy Framework (APF) features traceability as part of the Food Safety and Quality initiative. The APF includes a stated target of 80 percent of domestic food at the retail counter to be traceable through the agri-food continuum. No details are provided of why the target is 80 percent or how this is to be achieved, although apparently it is envisaged that this will be achieved through industry-driven initiatives rather than through regulation (AAFC, 2002).

As discussed earlier, the 2002 US Farm Bill introduced retail-level country of origin labelling for a variety of agricultural commodities. Mandatory country of origin and traceability labelling have major ramifications for the record keeping and information systems that will be required in order to substantiate a country of origin label.

DEMYSTIFYING 'TRACEABILIITY'

As the discussion in the previous section has demonstrated, there are numerous examples of private and public sector initiatives offering various degrees of traceability and quality assurances with respect to credence attributes. To what extent is traceability or origin labelling a private or public sector responsibility? This depends on whether there is market failure, and if a market failure is present, on the extent to which the benefits to consumers of mandating traceability and/or labelling outweigh the costs. To address these questions it is first necessary to consider the functions and potential economic benefits of traceability.

There are three main functions of a livestock traceability system. The first function is to facilitate the traceback of products or animals in the event of a food safety problem. Effective traceback enables the scope of a foodborne illness to be contained, thereby minimizing private and public costs, e.g. pain and suffering, lost productivity, medical costs, liability costs, damage to the reputation of a firm or an entire an industry, as was the case with the British beef industry with BSE, etc. By identifying and isolating the source of contamination a traceability system can protect firms who practice due diligence from free riders who fail to invest in good production practices or preventative measures. A traceability system allows ex post cost reduction *after* a problem has arisen. It performs a reactive function. Most livestock traceability programs, including the Canadian cattle identification system, primarily perform this reactive *ex post information* function.

The second function of a traceability system is to enhance the effectiveness of tort liability law as an incentive for firms to produce safe food. The incentive is provided by the threat of civil legal action and the resulting financial damages and harm to brand name capital. To the extent that industry-wide traceability systems can facilitate the establishment of legal liability the incentive for firms to adopt measures that enhance food safety is strengthened. This is also an ex post information function stemming from the aftermath of a food safety problem.

The third function of a traceability system is pre-purchase quality verification to reduce information costs for consumers through labelling the presence of credence attributes. This is an *ex ante information function* requiring proactive information provision and quality verification. The EU and Canadian livestock identification and traceability systems facilitate ex post traceback in the event of a problem. They do not reduce consumer information asymmetry by providing information ex ante on credence attributes. Paradoxically, the frequent justification for

introducing mandatory traceability and labelling, such as the EU beef labelling regulation, is the provision of useful information to consumers that the market would otherwise fail to provide.

Several EU Member States have already implemented the beef labelling regulation. Initial experiences suggest that this is an ex post, reactive labelling system rather than an ex ante information system that would reduce consumer information asymmetry about credence attributes.

> Other Member States report that their consumers, even when well informed, have not notably changed their patterns of consumption of beef (Commission of the European Communities, 1999, p.7)

One suspects that a similar reaction might accompany mandatory country of origin labelling in the US, unless information on origin is valued per se. However, if this were the case then presumably the food industry in the US would have identified country of origin voluntarily as a product differentiation strategy. We are left with a number of questions: Is traceability information useful to consumers? Can voluntary traceability/origin labels be a useful private sector product differentiation strategy? Is the absence of traceability information an indication of market failure and therefore a justification for mandatory traceability/origin labelling? To help answer these questions, we need a better understanding of consumer responses to traceability and quality verification information for food products.

CONSUMER WILLINGESS TO PAY: MYTH OR REALITY?

A set of experimental auction markets experiments were carried out to assess Canadian consumers' willingness-to-pay (WTP) for traceability, food safety and on-farm production

information for beef and ham products[1]. Experimental auctions are a method of eliciting non-hypothetical bid data in the absence of publicly available market data on the demand for traceability and quality verification characteristics.

The experimental auctions were conducted in Saskatchewan and Ontario in 2002. Subjects in Saskatoon were recruited from a range of demographic groups at the University of Saskatchewan, including students, faculty, professional administrative staff and maintenance staff. Subjects in Guelph were recruited from the consumer database of a private consumer research firm. A total of 204 people participated in the study, 98 in Ontario and 106 in Saskatchewan, with 104 participating in the beef auctions and 100 in the pork auctions.

Participants were given a beef (or ham) sandwich containing standard beef (ham) purchased from a retail store and had the opportunity to 'upgrade' their sandwich for a sandwich with additional verifiable characteristics (Shogren et al, 1994). Participants received Cdn$20 as compensation for attending the session. Four 'auction' sandwiches were used, each with different verifiable information. The meat in one sandwich had an extra assurance with respect to humane animal treatment. The second sandwich had an extra assurance regarding food safety standards and procedures that were over and above the industry norm. The third sandwich contained meat that was traceable to the farm of origin. The fourth sandwich combined all three characteristics: the meat was traceable to the farm of origin, with an extra assurance of humane animal treatment and an extra assurance of food safety standards/procedures[2].

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[1] This research was conducted in collaboration with DeeVon Bailey and David Dickinson from Utah State University who were conducting experiments in the US, the UK, Japan and Canada (Dickinson and Bailey, 2002). Agriculture and Agri-Food Canada funded additional data collection in Canada.

[2] The participants were assured that there was nothing wrong with the sandwich they had been given. It was regular meat purchased in a supermarket and therefore met all the requisite food safety standards. Instead there was additional verifiable information about each of the auction sandwiches. No deceit was used; the additional information was truthful.

A Vickrey Second-Price auction was used. There were ten separate rounds of bidding for each sandwich. Bids were collected for sandwich 1 (humane animal treatment), then sandwich 2 (food safety), then sandwich 3 (traceability), then sandwich 4 (all 3 characteristics). Participants wrote down their bids privately. At the beginning of each round of bidding for each sandwich, the second highest bid (or 'market price') from the previous round was announced. At the end of the 10th round, random draws determined which of the simultaneous sandwich auctions and which of the 10 rounds of bidding were binding. The highest bidder in that round for that sandwich exchanged their sandwich for the auction sandwich and paid the second highest bid price. Only one sandwich was auctioned off in each experiment. There was an equal chance that any of the rounds of bidding would be binding; thus participants had an incentive to bid honestly each time. The rational strategy for each participant was to bid their true willingness to pay to exchange their sandwich for the auction sandwich. A zero bid indicated that the individual was indifferent between their sandwich and the auction sandwich.

Figures 1 and 2 display average bid information for the beef and pork experiments respectively over the ten rounds of bidding. Traceability to the farm of origin, without additional quality assurances, elicited the lowest average willingness to pay. An ex ante quality verification such as an additional food safety assurance or an animal welfare assurance was of more value to the participants. Combining a traceability guarantee with positive quality assurances yielded the highest bids on average, although the average bid for the 'all inclusive' sandwich was less than the sum of bids for the individual attributes, suggesting a decreasing marginal willingness to pay for the attributes. This is consistent with results from the US traceability experiments (Dickinson and Bailey, 2002).

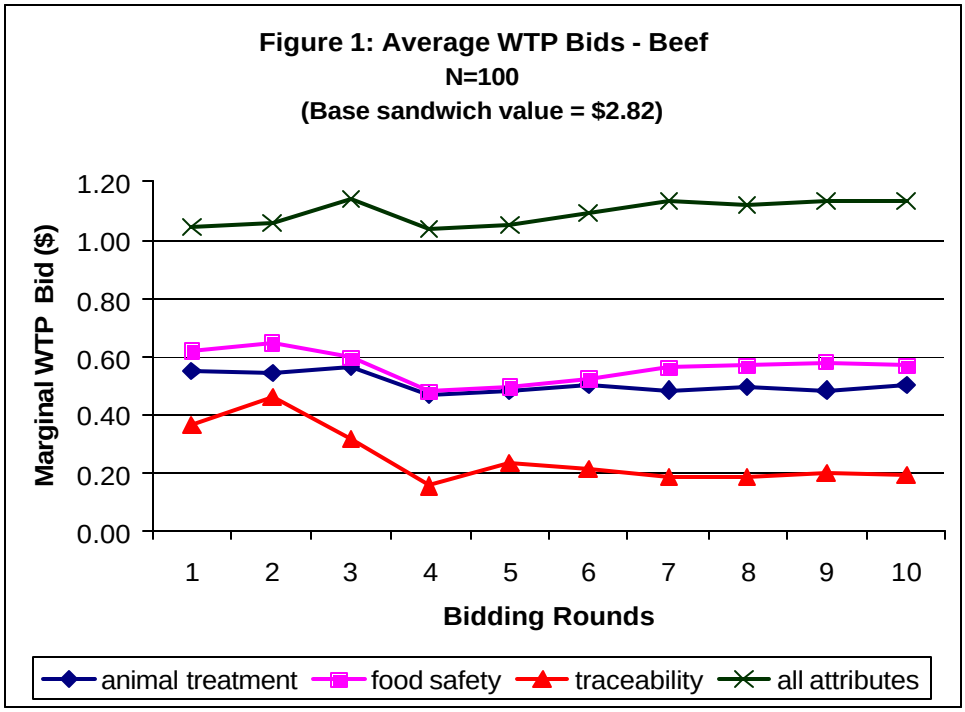
Figure 1: Average WTP Bids - Beef
N=100
(Base sandwich value = $2.82)
Marginal WTP Bid ($)
1.20
1.00
0.80
0.60
0.40
0.20
0.00
1
2
3
4
5
6
7
8
9
10
Bidding Rounds
animal treatment
food safety
traceability
all attributes

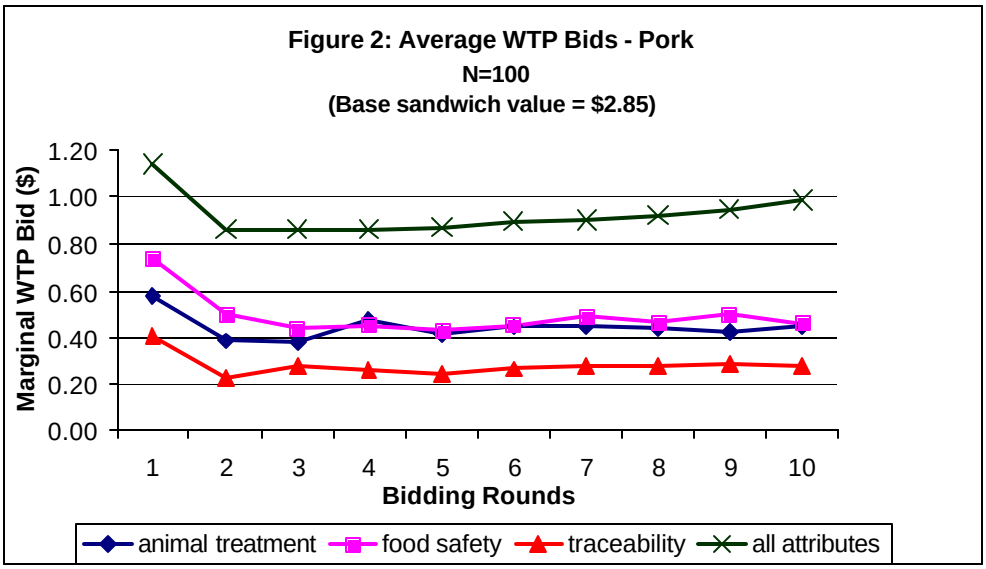
Figure 2: Average WTP Bids - Pork
N=100
(Base sandwich value = $2.85)
Marginal WTP Bid ($)
1.20
1.00
0.80
0.60
0.40
0.20
0.00
1
2
3
4
5
6
7
8
9
10
Bidding Rounds
animal treatment
food safety
traceability
all attributes

Average WTP (averaged across all subjects for the last 5 bidding rounds in both locations) to upgrade to a traceable beef sandwich was Cdn$0.20 (7% of base sandwich value[3]). Average WTP to add a food safety assurance was Cdn$0.56 (20%), to add an animal welfare assurance was Cdn$0.50 (17.6%) and to add all 3 assurances was Cdn$1.12 (40%)[4]. For the ham sandwiches, average bids were Cdn$0.28 (10%) for traceability, Cdn$0.47 (17%) for food safety, Cdn$0.44 (15.6%) for animal welfare and Cdn$0.93 (33.4%) for all three assurances[5].

Some caveats pertain to the interpretation of this average bid data. Caution should be exercised in extrapolating these numbers into other contexts. The percentages may not apply across an entire consumer budget or to different food products given budget constraints and different risk perceptions between products. Also, these are average values, as such they mask considerable variations in bids across participants. For example, there were a high number of zero bids for the 'traceability only' sandwich. Forty six percent of participants bid zero for the traceability only sandwiches (beef and ham) during the last five rounds of bidding, when bids are expected to have stabilized. This compares with 27% who bid zero on the sandwich with the humane animal treatment assurance, and 17% who bid zero on the sandwich with the additional food safety assurance. Only 7% of participants bid zero on the fourth sandwich that combined traceability with an extra food safety assurance and animal welfare assurance. Furthermore, due to the nature of a one day experiment, these bids are usually considered to be an upper bound on WTP (Dickinson and Bailey, 2002; Hayes et al, 1995).

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[3] The base sandwich value was calculated by asking respondents how much they would typically expect to pay for the type of sandwich provided to them in the experiment, and averaging these responses.

[4] This compares with US$0.23 (7.6%), US$0.63 (21%), US$0.50 (16.7%) and US$1.06 (35%) respectively in a similar US experiment where the base sandwich value was approximately US$3 (Dickinson and Bailey, 2002).

[5] In US experiments using ham sandwiches, Dickinson and Bailey (2002) report average bids of US$0.50, US$0.59, US$0.53 and US$1.14 (or 16.67%, 17.6%, 19.7% and 38%) for traceability, food safety, animal welfare and all three assurances respectively. The base sandwich was valued at approximately US$3.

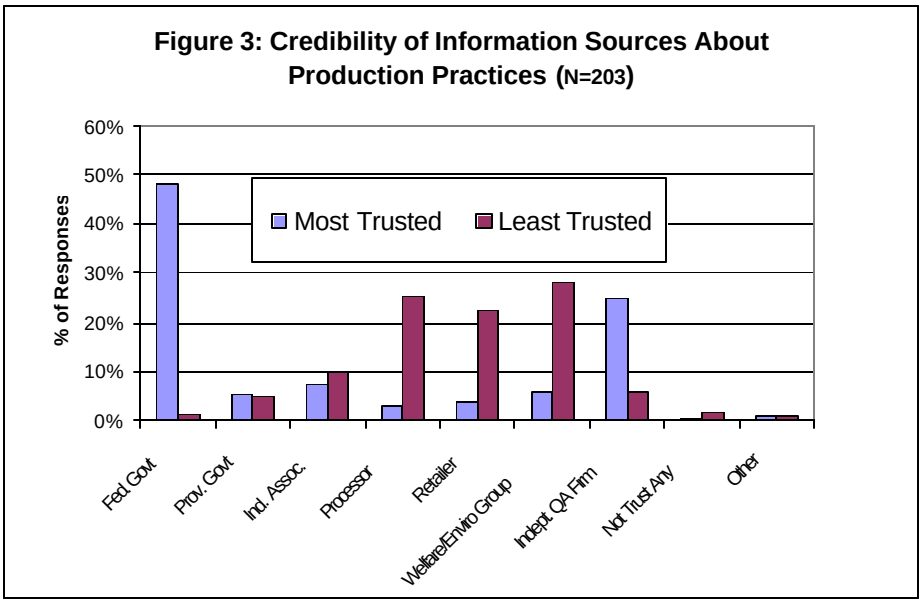
Nevertheless, it is clear from the graphs that while traceability was of value to some consumers, for the majority of people traceability by itself delivered considerably less value than ex ante quality or safety assurances. Consumers want to know their food is safe before they consume it. Ex post reactive traceability systems perform an important economic function in limiting the costs arising from a food safety problem and in maintaining consumer confidence in an industry, but they do little to reduce consumer information asymmetry. Traceability, bundled with other quality assurances, delivers more value to consumers. Traceability may be a necessary but not sufficient condition for ex ante verification of quality attributes.

Responsibility for providing credible information to consumers on quality attributes could be the role of individual firms, industry/commodity associations, independent private sector third parties or, if there is a market failure, the government. Following the experimental auction, the Canadian participants completed a survey. From a list of seven potential sources of information, respondents were asked to identify which source they most trusted and least trusted to provide information about production practices used by the farmer[6]. Figure 3 displays the responses to this question. Credible third parties were very important. Almost 50 percent of respondents said they would most trust a Federal government agency, such as the Canadian Food Inspection Agency, to provide this information. Another quarter of respondents placed most trust in an independent quality assurance firm.

Almost one third of the participants indicated that animal welfare or environmental groups (such as Greenpeace or PETA – People for the Ethical Treatment of Animals) were the least trusted of the information sources. Some respondents commented that these groups had an agenda, as such they did not view them as an objective source of information. Perhaps

[6] For a break-down of these results by province see Hobbs, 2003.

surprisingly, food processors and retailers were regarded as the least trusted source of information by 25% and 23% of respondents respectively. Some people perceived these sources to have a vested commercial interest that might give them an incentive to mislead consumers. This points to a potential credibility problem for the food industry in providing traceability and quality assurances to consumers and underlines the importance of third party verification or certification in building consumer trust.



TRADE IMPLICATIONS

Regulatory initiatives to mandate traceability, origin or production method labelling create problems in the international trade arena. Some countries have attempted to justify mandatory labelling of credence attributes on the basis of consumers' "right to know", for example, genetically modified foods and country of origin labelling.

The WTO allows country of origin labelling under Article IX, Marks of Origin of the 1994 GATT agreement. Imports can be labelled with the county of origin as long as the labelling requirement does not seriously damage the good, materially reduce its value or result in an

unreasonable increase in its cost (Kerr, 2003). It is possible that mandatory COOL could result in an 'unreasonable' increase in the cost of a product, however, this would be difficult to determine ex ante. Kerr (2003) suggests that US mandatory COOL regulations are likely to impose higher costs on the Canadian livestock sector in the short run than the long run. The burden of these costs would likely have been incurred before a WTO ruling could be obtained, assuming Canada successfully challenged the US legislation and was able to show that value was 'materially' reduced or that costs were 'unreasonably' increased as a result of mandatory COOL.

The National Treatment principle of the WTO requires that a COOL requirement for imports also be applied to domestically produced goods in the US. This is significant, as it will almost certainly increase supply chain segregation costs for US beef packers and retailers. Unlike Canada, the US cattle industry does not have a livestock traceability system. Its ability to implement full traceback is likely to be more limited due to higher throughputs and larger production units relative to the European livestock sector. US cattle industry representatives have openly questioned the usefulness of mandatory country of origin labelling, arguing that it will impose logistical costs on the US industry without clear benefits (Western Producer, 2003). The requirement to label products of mixed origin is expected to lead to a decrease in Canadian livestock exports to the US, given the increased costs for the downstream packing and retailing industry in separating and labelling meat from animals born and raised in Canada but slaughtered in the US. If this leads to an increase in cattle processed in Canada, we may eventually see higher levels of Canadian meat and meat product exports to the US. These would be labelled with a Canadian country of origin label. The supply chain logistics of labelling Canadian-only products are likely to be lower than those faced by a US packer having to verify a US country of

origin designation by proving that the meat is from animals born, reared, slaughtered and processed in the US.

Proponents of mandatory country of origin labelling in the US argue that it enshrines in law consumers' right to know about the origin of products. Opponents argue that a mandatory regulation panders to the protectionist interests of a segment of the domestic industry. It imposes unnecessary costs on the food industry and will adversely affect exports from other countries, particularly as US processors will be required to provide proportional country of origin content on food labels. Voluntary labelling of "US origin" would suffice to inform consumers if there is a strong demand for domestically produced food. The fact that voluntary labelling has not emerged suggests the lack of a strong market incentive to provide this information.

To summarize, it is important to understand consumer attitudes to food safety and food quality issues, including how consumers respond to different traceability, labelling and quality assurance initiatives. Of immediate interest is the extent to which these initiatives belong in the private sector as innovative product differentiation strategies, or whether a convincing market failure argument can be made for mandating traceability and labelling on the basis of reducing consumer information asymmetry.

It appears that the EU mandatory beef labelling and traceability regulation, while perhaps performing a useful ex post cost reduction function in the event of a food safety problem, does little to reduce consumer information asymmetry ex ante. Mandatory retail country of origin labelling in the US will not provide consumers with information about other credence attributes beyond the country of origin. Mandatory labelling policies create the potential for international trade tensions when they adversely affect exports. On the other hand, industry-driven traceability systems have emerged (often with the encouragement and support of government). In these

cases, the private sector may wish to reduce the potential costs of a food safety outbreak or reduce the monitoring and enforcement costs associated with managing supply chain relationships, or may simply be attempting to maintain consumer confidence. Alternatively, the industry may have recognized a product differentiation opportunity. Often the traceability system is a platform on which additional quality assurances can be provided to consumers. Traceability and ex ante quality verification throughout the supply chain could yield sufficient economic benefits without the need to extend traceability labelling to the retail counter.

At the heart of the issue is the need to understand whether consumers value information on traceability and country of origin, and if so, for what reasons. If country of origin labelling is only valued as a proxy measure of safety or quality it is more efficient to provide this information through direct quality signals, including third party certification of quality, or regulatory process and/or performance standards for food safety.

Mandatory retail labelling of traceability and product origin information is likely to impose significant economic costs on the agri-food industry and will lead to international trade tensions, without an obvious demonstration of direct consumer benefits. This does not mean that traceability is unimportant. On the contrary, it can play a central role in reducing the transaction costs of managing supply chain relationships, in reducing risk and in strengthening tort liability incentives for food safety. Thus, it is important to distinguish between simple traceability and more complex quality verification systems, and to recognize the extent to which these systems play a supply chain management role or a more proactive role in informing consumers about unobservable credence attributes.

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