9. Country of Origin Labeling

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Abstract/Summary

Until recently voluntary country-of-origin labeling of food products was relatively uncommon in the U.S. The mandatory country of origin labeling (MCOOL) regulation, which went into effect in 2009, requires food retailers to notify their customers of the country of origin of various agricultural products. In this presentation, we discuss several approaches to evaluating the impact of the MCOOL policy on welfare. We consider the economic implications of MCOOL in markets in which product origin provides an important cue to consumers who have different rankings of products from different countries as well as in markets in which product origin serves as a signal of quality to all consumers.

The Value of Country of Origin Labeling

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Introduction

- Country of origin labeling of food products was uncommon in the U.S.
  - Import share was 7% of value and 15% of volume of supply in 2005
- Mandatory country of origin labeling (MCOOL) regulation took effect in 2009:
  - Retailers must notify their customers of the country of origin of various muscle cut and ground meats, fish, perishable agricultural commodities (fresh and frozen fruits and vegetables), and nuts
  - US imported 11.6% of beef, 83.3% of fish and shellfish, 23.1% of fruits, and 16.6% of vegetables covered under MCOOL in 2001
- **Goal** is to evaluate the impact of MCOOL on welfare in markets in which
  - different consumers have different quality rankings of products from different countries
  - firms value reputation for high quality

Who wanted COOL?

Some history of the debate surrounding MCOOL (Krissoff et al 2004)

- Various agricultural and consumer advocacy group have argued for COOL

- Proponents included
  US cow-calf producers
  fruit and vegetable grower/shipper associations

- Proponents argued that
  consumers prefer domestic products that are perceived as safer, higher quality, and helping US producers

- Opponents included:
  US cattle feeder and hog finishing operations
  meat packers
  processors
  large retailers

- Opponents argued that
  consumers do not care and COOL is costly

Why voluntary COOL was not observed often before MCOOL policy?

Some earlier arguments summarized in Krissoff et al 2004:

1. Consumers do not care about COOL:
 - there are no country-specific attributes (flavor, safety, etc) that are important to consumers

2. Consumers might prefer the imported product
 - e.g., New Zealand and Australian lamb
 - geographical indications send signal of high quality and specific attributes
 - "Product of USA" is not informative because it is too inclusive to signal quality that varies widely across producers in US

3. COOL is valuable to consumers but provision of COOL is prohibitively costly
 - Not likely to be the case because sometimes COOL is provided

4. Consumers do not trust in product-origin labels without third-party certification:
 - country of origin is typically an experience or credence attribute so false labels are possible
 - no evidence that this is the case in US

5. COOL is profitable but the actors in food supply chain fail to maximize joint profits:
 - not likely because there are large players and retailers and processors opposed MCOOL

Why and how may consumers value COOL?

1. Products with country-specific **experience** and **credence** attributes
   - **search** attributes are observable before purchase and consumption:
     - color, expiration date
   - **experience** attributes are observable only after purchase and consumption:
     - flavor, freshness
   - **credence** attributes are not directly observable to consumers even after purchase but are verifiable by a third party
     - nutritional content, environmental impacts

- Country-specific attributes can create potential for
  - **horizontal** differentiation:
    different consumers have different quality rankings of products from different countries
  - **vertical** differentiation:
    all consumers have the same ranking of products from different countries but vary in the degree to which they care about the quality differences

2. Consumer ethnocentrism (Lusk et al 2006)
   - consumers care about the country of origin independently of other product attributes, i.e. country of origin itself is a product attribute

Imported versus Domestically Grown Food

- "the COOL program is neither a food safety or traceability program, but rather a *consumer information* program" (USDA)
- Same safety standards for imported and domestically grown food
- Production methods may still vary across exporting countries
  - Unique flavor or nutritional content of food products from different countries

Some Empirical Evidence of Horizontal Differentiation

- Grass-fed Argentine, grain-fed Canadian, US corn-fed beef
- Umberger et al (2002):
  62% preferred U.S. beef
  23% preferred Argentine beef
  15% were indifferent
- Sitz et al (2005):
  - similar results for U.S. and Australian beef
  - for US vs Canadian beef:
    44% preferred US beef
    29% preferred Canadian beef
    27% were indifferent
- Consumers bid from 30% to 60% more for their preferred variety of beef

Why Do Retailers Not Differentiate Products by Country of Origin?

- Umberger et al (2002):
  - Most of the imported beef is not labeled as such, is marketed as **generic** beef, and is not distinguishable from domestic beef in the retail meat case
  - The flavor of imported grass-fed [or barley-fed] beef may be very unique to domestic consumers
  - If not all consumers prefer the same flavor, then COOL "may be beneficial from a **differentiated, branded** product perspective"
- Feuz et al (2007):
  - 28% were willing to pay more for Canadian over U.S. beef
  - Canadian beef imports is 4% of U.S. production
  - There could be strong demand for **branded** Canadian beef in US

Why Do Retailers Not Differentiate Products by Country of Origin?

- Why do U.S. retailers prefer to "commoditize" beef as well as other products with experience or credence attributes that are country-specific by withholding information about product origin?

- The average increase in costs due to COOL is 5.6% (USDA)

- Probably there are other "costs" that make COOL unprofitable:

  - With MCOOL, suppliers market differentiated products as generic
  - "retailers and packers plan to use the catch-all label that says 'Product of the US, Country X, and/or Country Y' on as much beef as possible. […] Tyson Fresh Meats has already told its customers it will adopt the catch-all label for all its beef. […] The bulk of beef sold at retail will remain a commodity." (Beef Magazine 2008)

Previous Literature on Geographical Indications

- Previous literature studied geographical indications as **costly** credible certification of quality in markets with **vertical** differentiation

- No evidence that consumers do not trust country-of-origin information provided by the U.S. food marketing system (Krissoff et al 2004):

  - no participants in the voluntary labeling programs for beef and other products that were offered by USDA before the mandatory labeling policy went into effect

Disclosing or Withholding Country of Origin Information as a Marketing Strategy

- When credible **voluntary** COOL is possible, analyzing the effects of MCOOL requires assessing its scope (Carter et al 2006):

  - Provision of information about product origin is endogenous
  - Conditions under which no information is provided in equilibrium
  - Compare equilibria without and with labeling

- Modeling approach used in this paper:

  - **One** firm that sources a good from two countries
  - A model of **horizontal** differentiation in which consumers cannot identify the country of origin without labeling
  - A (possibly prohibitively high) **search cost** may be required to match a consumer with her preferred variety

Matching Costs in Retail Food Markets: Justification

- Muscle cuts and ground meats, and fruits and vegetables have short shelf-life and seasonal supply

- When domestic supply is low or unavailable, and storage is costly, off-season demand is met by imports (Huang and Huang 2007)

- The imported and domestic varieties are typically marketed during different (overlapping) time periods

- Imports occur not to segment the market but to assure consumer access to a "generic" product throughout the year

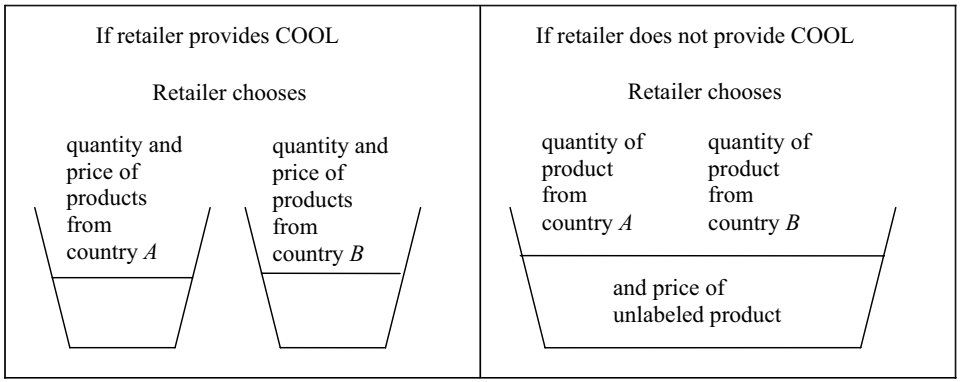
  - "…any additional segregation of livestock and finished product will translate into higher wholesale prices and *reduced product availability*, Tyson warns." (Beef Magazine 2008)

Information is Less Valuable with Search Costs

- Information about product origin **does not improve** matches between consumers and products if only a subset of varieties is available:
  - Surveys of Belgium consumers found that origin-labeled meat products were perceived as less convenient to purchase due to reduced availability (Verbeke and Roosen 2009):
    - "We might have to drive further to find this product"; "We don't think it is available at our local butcher or in the supermarket we usually visit."
- A "variety-constrained" seller faces a tradeoff when deciding whether to provide information about product origin:
  - consumers who find their preferred variety are willing to pay more
  - consumers who do not find their preferred variety are willing to pay less, and may stay out of the market altogether

Model of a Market with Search and Horizontal Differentiation

Supply Side



Demand Side

- There are four segments of consumers

segment 1: willing to pay \$1 for one unit of product from country A,
willing to pay \$1 for one unit of product from country B

segment 2: willing to pay \$2 for one unit of product from country A,
willing to pay \$1 for one unit of product from country B

segment 3: willing to pay \$1 for one unit of product from country A,
willing to pay \$2 for one unit of product from country B

segment 4: willing to pay \$2 for one unit of product from country A,
willing to pay \$2 for one unit of product from country B

- Each segment accounts for one quarter of the population

Consumers Do Not Always Find Their Product Variety when Supply is Seasonal

- consumers typically visit a small number of grocery stores and each retail outlet carries a limited number of varieties in a given product category
  - "Lori Baertsch of Eagan, Minn., recently made multiple trips to a Target Corp. store to find her husband's favorite shampoo, Pert Plus. She was unaware that Target had pulled the item. Ms. Baertsch, a stay-at-home mother, asked her sister-in-law to pick up a giant bottle of Pert Plus using her Sam's Club membership." (Bart et al 2009)

Product Origin Labeling

- Two information regimes: voluntary and mandatory labeling of products with variety (its country of origin)
- Labeling of each product with variety is **costless**
- In the voluntary labeling regime: the monopolist decides whether or not to label products with variety (country of origin)
- In the mandatory labeling regime: each product is labeled with its variety (country of origin)
- If a product is not labeled with its variety, a buyer does not know which variety he is matched with
  - For example, different varieties of meats, fruits, and vegetables can be similar in appearance but differ in flavor or other experience attributes such as crunchiness or toughness

Timing of Decisions

1) the seller chooses output of each variety

2) the seller decides whether to label products with variety
   - If the seller decided to label, he sets the price for each variety
   - If the seller decided not to label, he sets the price of the unlabeled product

3) The "random" matching of consumers and products takes place
   - In the labeling regime, each consumer sees the variety which she is matched with and its price, and decides whether to purchase or not
   - In the non-labeling regime, each consumer decides whether to purchase upon seeing only the price but not the product variety

Voluntary Labeling: To Label or Not to Label

- **The profit-maximizing marketing strategy is to sell products without COOL and set the price at $1.5**

Gross Revenue without COOL = Quantity of Unlabeled Product × Price per Unit

$$= \Big(\underbrace{\frac{1}{4}}_{\substack{\text{Consumers with} \\ (\$2,\$2)}} + \underbrace{\frac{1}{4}}_{\substack{\text{Consumers with} \\ (\$1,\$2)}} + \underbrace{\frac{1}{4}}_{\substack{\text{Consumers with} \\ (\$2,\$1)}}\Big) \cdot \Big(\underbrace{\frac{1}{2}}_{\substack{\text{Probability that} \\ \text{will get } A}} \cdot \$1 + \underbrace{\frac{1}{2}}_{\substack{\text{Probability that} \\ \text{will get } B}} \cdot \$2\Big) = \$1.125$$

Gross Revenue with COOL = Quantity of Product from Country A × Price
+ Quantity of Product from Country B × Price

$$= \max\Big[\frac{1}{2} \cdot \underbrace{\Big(\frac{1}{4} + \frac{1}{4}\Big)}_{\text{Niche Market } A} \cdot \$2 + \frac{1}{2} \cdot \underbrace{\Big(\frac{1}{4} + \frac{1}{4}\Big)}_{\text{Niche Market } B} \cdot \$2, \quad \frac{1}{2} \cdot \underbrace{\$1}_{\substack{\text{Mass} \\ \text{Market } A}} + \frac{1}{2} \cdot \underbrace{\$1}_{\substack{\text{Mass} \\ \text{Market } B}}\Big] = \$1$$

Intuition:
by targeting the uninformed "choosy" consumer seller achieves an optimal balance between the volume of **sales** and **price**

- If the sizes of consumer segments are different, the retailer may prefer to label the products and set the prices equal to $1 (mass market) or $2 (niche market)

Mandatory Labeling and Welfare

- In this environment, the retailer's profits (total profits in the supply chain) cannot increase in the mandatory labeling regime
- No scope for labeling policy if the share of consumers with high valuations is sufficiently small (*no effect of prices*) or large (*COOL is already provided*)
- If segments are similar in size social welfare may increase or decrease under mandatory labeling

The effect of mandatory labeling on welfare is

- **positive in mass markets**
- **negative in niche markets**

Extensions: Costly Search for Preferred Variety

- Typically consumers are able to search for their preferred varieties

- Without COOL the outcome is the same when consumers can search

- With COOL there will be some consumers who benefit from COOL: they find their preferred products but had to gamble before

- The seller *always* achieves higher profits by labeling products with variety when perfect matches between consumers and products are costless

- The basic model overstates the scope but understates the welfare gains from MCOOL

Extensions: Consumer Learning from Experience and Dynamic Pricing

- Initially a consumer does not know her actual taste (willingness to pay)

- Forward-looking consumers value information about the expected future benefits

- COOL has "dynamic" effects:

(i) Inexperienced consumers are willing to pay *more* because they will be able to make better purchasing decisions *in the future* if they know which variety they buy today

(ii) Incompletely experienced consumers with a negative experience may buy *less frequently* since they stop buying the variety for which they have low valuations as soon as they learn about it

Extensions: Consumer Learning from Experience and Dynamic Pricing (Cont.)

- In sufficiently stable markets, the second effect dominates and the seller achieves **higher** long-run profits by **withholding** information about product origin

  - The seller targets a segment of consumers who found out that they have low valuations for one of the varieties but are yet to experience the other variety

  - Using this pricing strategy, the monopolist increases sales because *incompletely informed* consumers with actual uniformly low valuations buy *more frequently* when the products are unlabeled

- Suppose that consumers cannot tell which varieties they have already tried without labels:

  - Without COOL profits are higher because consumers with low valuations buy more frequently and stay in the market longer since they are not sure whether or not they have encountered both varieties and keep on hoping that the variety that they like is still out there

Conclusions

- In a setting with private valuations the multi-product monopolist prefers to provide or withhold information about product variety depending on the distributions of valuations and search costs:
  - The equilibrium labeling policy depends on the relative sizes of the segments of indifferent and choosy consumers
  - MCOOL increases or decreases welfare depending on the pricing strategy of the seller under mandatory labeling policy

- Several extensions of the basic model:
  - costly search (matching) for preferred varieties,
  - more general distributions of valuations
  - consumer learning their valuations by buying and trying the products in a dynamic model

- **Implication for producers and retailers:**
  - **continuous availability** of products may underpin branding or niche marketing profitability

Conclusions (Cont.)

- Agricultural markets are characterized by **aggregate** uncertainty relating to the quality and attributes of food products rather than **idiosyncratic** uncertainty studied in the paper

- Recurring patterns of food safety failures suggest that a model with **common** values for the seller's products may be more suitable for studying the economics of COOL

- Next we will consider a **reputation**-based approach to COOL

COOL and Firm Reputation for Safe and High Quality Food Products

- Market failures call for policy interventions

- But, first, a bit more of important economics jargon

- Imperfect Observability (Asymmetry of information): consumers do not know how hard the grower is working

- Moral Hazard (also arises after buying yield loss insurance …): efforts to ensure quality/safety are costly and are not observed by consumers

- Adverse Selection (riskier producers are more likely to insure …): product quality varies across producers and is not known to consumers

- **Countries as bearers of reputation**: well recognized in the marketing literature

- **What are the effects of COOL on reputation of firms located in different countries?**

- Consumers only observe the outcome which is an **imperfect** signal about firms' effort/quality choices (investment in food safety)

- Even when firms choose high quality, safety failure or quality lapses may occur

COOL and Reputation: Moral Hazard

- To provide incentive to exert effort an "implicit contract" between consumers and firms prescribes reciprocal behavior:

  - Consumers are willing to pay quality premium ("carrot") until low quality output (contamination or disease outbreak occurs)

  - Low quality output is followed by the breakdown of trust and either termination or a period of low prices ("stick")

- Because firms cannot sustain good reputation and earn quality premium forever, COOL may have non-trivial effects on reputation formation and maintenance

- COOL (or Geographical Indication branding) decision is based on the extent to which joint marketing increases the **longevity** and **rewards** from good reputation (and possibly shortens the period of breakdown in trust)

COOL and Reputation under Imperfect Observability and Moral Hazard

- Joint marketing (by a group of producers)
  - allows producers to send a clearer signal of their **average** quality since idiosyncratic noise is reduced
  - creates "**free-rider**" incentives and negative externalities that are not internalized by individual (independent) producers

- **When producers are sufficiently forward-looking (care about the long-term profitability) and the number of producers is sufficiently large complete disclosure of product origin (complete traceability) is not optimal, but some disclosure is optimal**

Conclusions

If moral hazard is important, then producers in different countries may be better off marketing products without COOL because it is easier to maintain the average quality than individual quality

Conclusions (Cont.)

- In an environment with **adverse selection:**
  - each country can be safe or unsafe (but this is unknown to consumers before a safety failure occurs)
  - firms can exert (unobservable) costly efforts to increase food safety
  - without labeling firms' locations are unknown to consumers

- Firms that are located in the same country prefer to withhold this information from consumers

- Firms that are located in different countries prefer to reveal this information to consumers

=> Consumers do not trust labels without third-party certification

- (Credible) MCOOL
  - Increases welfare in markets served by firms located in different countries

  - Decreases welfare in markets served by firms located in the same country

Thank you!

Questions?