



Evolving beef export market access requirements for age and source verification



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ABSTRACT

We analyze the economic impacts of changes in age and source verification requirements and associated adjustments in international trade of US beef using an equilibrium displacement model. Because the United States lags behind many countries in adopting animal traceability systems, the United States risks losing export market access. The loss of an export market the size of South Korea's would cause a decline of US meat industry producer surplus of \$1751 million over 10 years or 0.23% of its 10-year cumulative discounted present value. Additionally, we find that only small increases in US beef exports would be necessary to offset direct costs associated with adoption of age and source verification.

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Introduction

International beef markets are rapidly changing. Increasingly, access to beef importing countries requires sanitary, phytosanitary, and related meat and animal traceability protocols. Countries that have well-developed mandatory cattle identification (ID) and traceability programs possess comparative advantages in beef exports relative to countries without such systems. Animal ID and meat traceability systems are becoming widely adopted by many key beef exporters and import destinations (Schroeder and Tonsor, 2012).

The Canadian announcement of the discovery of a bovine spongiform encephalopathy (BSE) infected Alberta cow in May 2003 caused an immediate closure of international markets for Canadian live cattle and beef products. Given the importance of export markets for the Canadian cattle industry (i.e., 50% of annual production was exported as live cattle or beef products prior to the BSE announcement (Boame et al., 2004), the closure had a significant impact on live cattle prices. Canadian slaughter cattle prices fell from \$108/cwt in April 2003 to \$38/cwt in July (Livestock Marketing Information Center, 2011). US beef export destinations were also closed after the announcement of a US BSE case in December 2003. Prior to the Canadian BSE case,

the Canadian beef industry had an animal identification program in place. Some have suggested that export markets were re-opened more readily for the Canadian industry relative to the US industry because of the existence of the Canadian cattle identification program. Although it is difficult to verify such claims, Murphy et al. (2008) note, "...there is general consensus within the Canadian beef industry that it (the Canadian cattle identification) was an invaluable tool during the BSE investigations" (p. 281).

The objective of this research is to estimate economic impacts on US livestock and meat producers and consumers of increasing requirements for traceability by importers of US beef. Such requirements have already been implemented by major beef exporting countries such as Canada, Australia, and New Zealand. Given the importance of export markets for the US beef industry, the analysis is important for identifying competitive advantages for countries that do not have formal animal ID systems in place and want to maintain a presence in international beef markets. Specifically, we quantify the short- and long-run economic impacts of adjustments in domestic participation in animal age and source verification (ASV) programs and international export market access on the US meat and livestock industry. After considerable controversy surrounding animal ID in the United States, a clearer understanding of the impacts associated with ASV has important implications. Given the role of the United States in global meat production and trade, inferences from this study are of interest to other global meat suppliers, international meat importers, and associated industry analysts.

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Animal identification in the United States

Various animal identification systems have existed for more than a century in the United States. These systems were generally used for managing disease, breeding herds, and ownership issues. Over the past decade, the US cattle industry has been debating and adopting a variety of animal ID programs. In 2002, the National Institute for Animal Agriculture established a task force to develop an animal ID system. This resulted in the US Animal Identification Plan which served as the foundation for the National Animal Identification System (NAIS) (USDA, APHIS, 2005). NAIS was initially designed to be a mandatory system that would include premises registration, identification of livestock either individually or by groups, and the reporting of livestock movements. However, after significant opposition to NAIS, the USDA announced in August 2006 that NAIS would be a voluntary system (USDA, APHIS, 2006).

Nonetheless, opposition to voluntary NAIS continued. In February 2010, USDA-APHIS changed directions and announced a new, more flexible framework for tracing animal diseases (USDA, APHIS, 2010). Following 2 years of discussion between the USDA and various stakeholder groups, the USDA published its final rule for *Traceability for Livestock Moving Interstate* in the Federal Register on January 2013 (Federal Register, 2013). The new regulations established rules for the movement of livestock across state boundaries. Specifically, livestock that were moved across state lines, unless exempted, would be required to have an official identification and be accompanied by an interstate certificate of veterinary inspection or other documentation, such as a brand certificate.

In addition to federal programs, state-level identification programs have been evolving. For example, in October 2012 the Texas Animal Health Commission (TAHC) announced a mandatory animal ID system for adult cattle that changed ownership in Texas effective January 1, 2013. This system was designed to "... preserve the TAHC's ability to identify and trace animal movements quickly and effectively, no matter which disease is involved" (TAHC, 2012, Pg. 1).

Age and source verification in the United States

Smith et al. (2005) reported that the United States is "lagging behind many countries in developing traceability systems for food in general and especially for livestock, and their products" (p. 174). A central reason for the lag is that the US cow-calf production sector is characterized by a large number of small, decentralized operations who do not readily see direct benefits associated with increased costs of an animal ID system (Tonsor and Schroeder, 2006; Schulz and Tonsor, 2010a,b). In addition, the majority of US beef production is consumed domestically, and given that US consumers are not insisting on animal ID, many US beef producers do not see much advantage from incurring the additional costs associated with animal ID systems.¹ Furthermore, the US federal government supports voluntary rather than mandatory animal tracing systems in contrast to many major meat importing and exporting countries. If those trends continue, the United States could become less competitive and lose access to selected export markets (Murphy et al., 2009).

Following discovery of bovine spongiform encephalopathy in the United States in 2003, several countries began to require age verification of cattle in order for beef from those animals to be eligible for import. As a result, voluntary US Department of Agriculture (USDA) beef export programs such as the Agricultural

Marketing Service's Export Verification (EV) program became more relevant. USDA EV programs detail specific eligible product requirements for each beef export destination country. As of September 2012, 19 countries, one territory, and the European Union were enrolled in USDA EV programs (USDA FSIS, 2012). Export requirements vary by country, but many of the major US export markets require that beef imported into their country come from cattle that were produced under an approved USDA export verification program that includes documented and verified information regarding the animals' ages and ranches of origin (Schroeder and Tonsor, 2012). According to Schroeder and Tonsor (2012), approximately 10% of steers and heifers slaughtered today in the United States qualify for these USDA verification systems with most of these being in ASV programs.

Age and source verification programs are evolving, and as such, corresponding literature on the economic impacts is sparse. Schumacher et al. (2012) used conjoint analysis to estimate that the typical feedlot manager places a \$5.84/cwt premium for feeder cattle carrying ASV. This estimate is similar with auction market analysis by Blank et al. (2009) who estimated age and source verified calves receive premiums of \$5.31/cwt. In contrast, Zimmerman et al. (2012) and Lawrence and Yeboah (2002) estimated premiums of \$2.38/cwt during 2008–2010 and \$1.30/cwt during 1997–2000, respectively. Although not specifically focused on ASV, Pouliot (2011) and Resende-Filho and Buhr (2008) find packers place a median premium for fed cattle traceability of C\$0.04 per lb. of carcass and \$0.47 per head, respectively.

Our analysis contributes to the animal ID and traceability economic literature in several important ways. First, this is the first known study that estimates added production costs associated with ASV calf certification. Given the recent increase in participation of ASV and similar ID programs, an assessment of added production costs is needed. Furthermore, we expand on Schroeder and Tonsor's (2012) review of global animal ID and traceability systems by providing an economic assessment of the United States, as a major beef exporter, falling behind global standards and losing export beef market access. We also estimate the additional export demand for US beef necessary to encourage varying levels of voluntary adoption of ASV. With the February 2013 announcement that Japan will allow imports of beef from cattle less than 30 months of age, this expands the potential number of cattle that could enter this market, provided they can meet the age verification requirement. Our results are timely and will have implications for the development and participation in animal ID and traceability programs for beef exporting countries.

Economic model

A multi-market partial equilibrium model of the US meat industry is used to estimate the effects of industry costs incurred through the adoption of ASV on US livestock and meat producers and consumers. In general, increased costs are dispersed throughout a vertically-related marketing chain and livestock and meat prices and quantities exchanged are impacted. Furthermore, changes in retail prices for one meat commodity influence the demand for substitute meat products. Expansion of ASV could also positively influence domestic and international demand for meat products. However, the extent of these potential changes is difficult to forecast and forms the foundation for scenarios discussed and evaluated below. The economic model utilized in the current study is an updated version of the multi-market partial equilibrium model documented in Pendell et al. (2010). Market parameters, including the supply and demand elasticities for the different commodities across the various sectors, were retained

¹ The United States exported 10.53% of total beef production in 2011 for an estimated value of \$8.06 billion (LMIC, 2012).

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