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# Peanut trade and aflatoxin standards in Europe: Economic effects on trading countries<sup>☆</sup>

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## Abstract

The role of aflatoxin contamination in food safety is an important policy issue impacting food industries worldwide. This paper evaluates the economic implications of strict peanut aflatoxin regulation in Europe focusing on price and quantity effects of the policy. Equilibrium displacement modeling is applied on a source-differentiated market. Findings show that regulation tightening leads to price and quantity drop for the United States and other exporters, whereas China benefits owing to its price and quantity gains. Although both peanut exporters and importers share compliance costs from the aflatoxin policy, consumers in Europe pay a greater proportion of the costs.

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## 1. Introduction

Mycotoxins are one of the broad groups of food contaminants that receive close attention in international trade. Aflatoxins, known to be carcinogenic and immunosuppressive (Dash et al.,

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2007; Wild and Hall, 1999; Williams et al., 2004) are a notable type of mycotoxins. Adverse health impacts of mycotoxins primarily drive the growing food safety concerns among researchers and policy makers.

In recognition of the health risks posed by aflatoxins, the World Trade Organization's (WTO) Sanitary and Phytosanitary Standards (SPS) agreement allows member-countries to set their own food standards to protect consumers (Yue, Beghin, & Jensen, 2006). The WTO refers to this SPS policy as the 'precautionary principle'. Since 1998, food standards in industrialized countries have evolved with the European Commission announcing new aflatoxin regulations for imported food items (Otsuki, Wilson, & Sewadeh, 2001a, Otsuki, Wilson, & Sewadeh, 2001b). However, setting appropriate aflatoxin levels for foods, especially peanuts, has been a controversial policy issue among trading partners. For instance, the European Union (EU) standards require peanuts for direct consumption to contain levels not exceeding 4 parts per billion (ppb). Interestingly, the joint FAO/WHO Codex Alimentarius Commission (Codex), with the mandate of setting international food standards, recommends 15 ppb (FAO, 2004), while that of the United States of America (USA) is 20 ppb for peanut products. Globally, Europe has the strictest food regulations and peanuts fall under its list of target food crops.<sup>1</sup> The EU imports about 40% of peanuts from the international market (FAOSTAT, 2010). Limited peanut production in Europe explains its heavy reliance on imports. Major peanut exporters to the EU are China, USA, Latin America, and Africa. Boonsaeng, Fletcher, and Carpio (2008) indicate that Argentina, China, and USA accounted for 70% of world peanut exports in 2005.

Developing countries produce over 60% of peanut in the world (Upadhyaya et al., 2003). Exported peanuts are often consumed directly or processed into snacks, butter, and candy.

Following increasing concerns over possible deleterious influences of standards on trade, several studies have emerged (Nguyen and Wilson, 2009; Nogueira et al., 2008; Otsuki et al., 2001a, 2001b; Yue et al., 2006). In a seminal research, Otsuki et al. (2001a, 2001b) studied the impact of EU aflatoxin standards versus Codex, regarding Africa's food exports. Using gravity models, Otsuki et al. show that African food exports are adversely affected by strict aflatoxin standards in the European market. Acknowledging some limitations of using gravity models to assess regulations impact on trade, Otsuki, Wilson, and Sewadeh (2001a, p. 272) state that "as a result of the structure of a gravity model, the separate effects of . . . standards on import demand and export supply cannot be isolated." Generally, studies that employ gravity models show negative SPS impact on trade. A notable exception is Xiong and Beghin (2012) whose follow-up study—in connection with forecasts by Otsuki, Wilson, and Sewadeh—yield no substantial trade effects. Although Xiong and Beghin also employed the gravity model, they improved on two issues identified in Otsuki, Wilson, and Sewadeh's work, namely the use of time-invariant aflatoxin-levels data for the entire study period as well as a possible sample selection bias problem due to the exclusion of zero trade records. Consequently, Xiong and Beghin (2012) argued that Africa faces important domestic issues undermining its effective trade participation; hence EU standards have no significant effects on Africa's peanut trade.

Existing literature covering the economic impacts of SPS on food exports is limited (see Otsuki et al., 2001b; Maskus & Wilson, 2001). Moreover, a sizeable proportion of research on effects of food standards is descriptive with only a few quantitative studies (Josling & Roberts, 2011) mostly employing gravity models.

<sup>1</sup> Peanut is one of the world's most popular food crops (Nwokolo, 1996).

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