Chapter 18: Food Supply Chain Security: Issues and Implications

Douglas Voss* and Judith Whipple

*Corresponding author: College of Business, University of Central Arkansas, Conway, AR, USA

18.1 Introduction

Prior to September 11th, 2001 the private sector was well aware of the threat of terrorism. However, the terrorist threats they perceived were different than those perceived today. In the early 1990s, firms were mostly concerned about overseas employee kidnapping (Harvey 1993). Ports were more concerned with theft and smuggling (Thibault et al. 2006). Beyond airline hijackings, the use of supply chain assets as a method to inflict damage was far from the minds of corporate America.

This mindset changed drastically in the aftermath of September 11th. Following this event, the need to secure supply chains against terrorist-induced disruptions became more evident. As such, firms have begun to rethink “security” within the confines of their four walls as well as across the supply chain. Security is no longer just about theft or product damage, but now must incorporate an assessment of possible disruptions (intended as well as unintended) in an effort to prevent, detect, and potentially recover from such disruptions. This chapter will examine the issues and implications of supply chain security with particular focus on the food industry.

To begin, it is important to understand what a supply chain is, what supply chain management entails, and how supply chain security management is defined. A supply chain is defined as, “The combination of organizations and service providers that manage the raw material sourcing, manufacturing, and delivery of goods from the source of the commodities to the ultimate users” (Closs and McGarrell 2004 p. 8). In this sense, the supply chain represents a cradle to grave concept encompassing the flow of materials, information, and financial resources from production of raw materials to final consumption.
Managing these flows became recognized as a source of competitive advantage and led to the concept of supply chain management. *Supply chain management* is defined as “the inter- and intra-organizational coordination of the sourcing, production, inventory management, transportation, and storage functions with the objective of meeting the service requirements of consumers or users at the minimum cost” (Closs and McGarrell 2004 p. 8). Supply chain management seeks to leverage core competencies of supply chain partners in order to effectively and efficiently coordinate the flow of product, information, and money through the supply chain.

Terrorist threats complicated these efforts. Costs to secure the supply chain are estimated to reach $151 billion USD annually (Russell and Saldanha 2003). Motor and air carriers are expected to incur an extra $2 billion in costs (Wolfe 2001). Warehouses are expected to incur an extra cost of $1 to $2 per square foot (Warehousing Education and Research Council 2004). It has been estimated that ports will incur $1.1 billion in initial security expenses and an extra $656 million annually. Additional considerations include holding excess inventory to buffer against supply chain disruption (Lee and Whang 2003), a decreased ability to deliver goods on time due to new security processes and measures (Dobie 2005), and an increase in cycle times and lead-times that result (Lee and Whang 2003).

Supply chain managers do more than coordinate flows efficiently and effectively, but must also simultaneously protect the supply chain and its stakeholders from harm. The study of supply chain security management emerged from this dilemma. *Supply chain security management* is defined as, “the application of policies, procedures, and technology to protect supply chain assets (product, facilities, equipment, information, and personnel) from theft, damage, or terrorism, and to prevent the introduction of unauthorized contraband, people, or weapons of mass destruction into the supply chain” (Closs and McGarrell 2004 p. 8).

A number of observations can be drawn from this definition. First, supply chain assets are defined as not only the equipment and facilities used to carry out supply chain processes, but also the products, information, services, and human resources needed to conduct supply chain operations. Therefore, supply chain protection does not stop with securing a facility through gates and locks, but also encompasses maintaining the safety surrounding the product and people involved in supply chain activities. Second, a secure supply chain requires preventing the following actions: (1) biological, chemical or unauthorized agents from becoming incorporated in the product; (2) any illegal commodity to be intermingled with legal shipments; (3) transportation assets or a shipment’s contents to be used as a weapon; (4) unauthorized access to the product and/or supply chain network; and (5) disruptions of the supply chain network and/or its infrastructure. Third, supply chain security incorporates traditional focal points (theft and damage) as well as new concerns surrounding terrorist activity.

The remainder of this chapter will focus on a particularly important and vulnerable subset of the broader supply chain concept: food supply chains. The first section will explore the importance and challenges associated with food supply chain security. Section 2 will detail best in class security practices used by firms in the food industry. Section 3 discusses the role of security in the supplier selection decision. Finally, the chapter concludes with managerial implications.