Chapter 36
Economic and Environmental Costs of Meat Waste in the US

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ABSTRACT

Food waste is a major issue around the globe impacting food security, resource use, economic operations, and the environment. Meat waste, constituting approximately half of total annual meat production in the United States, is particularly relevant to address due to significant resource inputs used in livestock breeding and the meat production process. In this chapter, the authors monetize annual costs of natural resources including water, land, and energy, as well as emissions of methane and nitrous oxide embedded in wasted meat in the United States. Results indicate the total annual cost of $32-32.5 billion. The outcomes substantiate the need to reduce current levels of wasted meat in order to minimize economic, social, and environmental impacts on natural resources and make food and meat production more sustainable.

INTRODUCTION

One-quarter to one-half of total agricultural production is wasted at different points along the global food supply chain each year, amounting to approximately 1.3 billion tons (Gustavsson et al., 2011; Kummu et al., 2012; Lipinski et al., 2013; Lundqvist et al., 2008). Regardless of the varying estimates in the literature, the amount of wasted food is substantial and directly translates into quantities of natural resources used for food production that are also wasted when food is discarded. The food waste problem and its impacts are discussed below followed by a closer exploration of animal husbandry and meat waste.

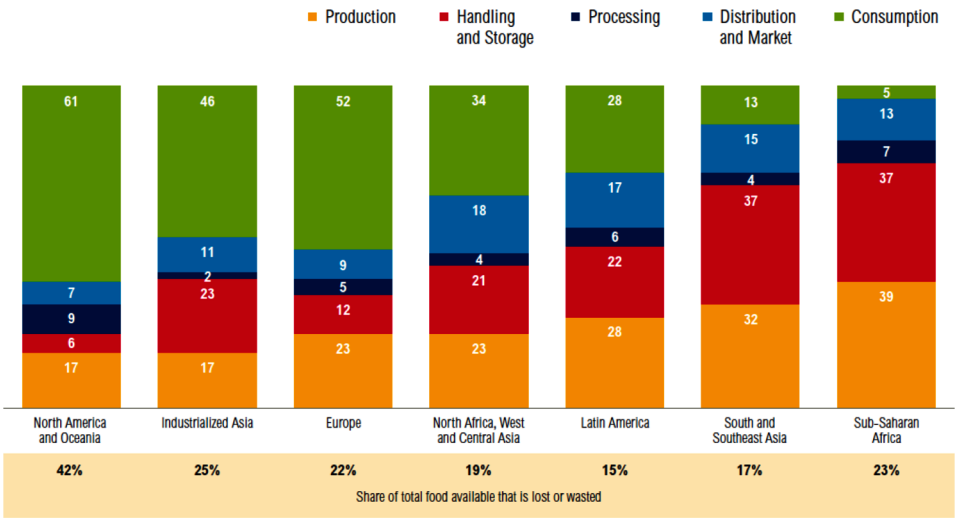
DOI: 10.4018/978-1-7998-5354-1.ch036

Food Waste Problem and Impacts on Natural Resources

Global food surplus, and particularly the surplus in high-income developed countries, has increased dramatically in the last few decades and is a root cause of food waste (Papargyropoulou et al., 2014). Agronomists recommend a food supply of 130 percent (2600 kcal/capita/day) to protect against unexpected environmental disasters as a result of resource overuse that may cause famine (Papargyropoulou et al., 2014). High-income developed countries regularly produce on average at least 1000 kcal/capita/day above the recommended food supply (1500 kcal/capita/day extra in the US), which could feed nearly 700 million people with an adequate vegetarian diet (Smil, 2004).

Both developed and developing countries generate large quantities of food waste, though they differ substantially in terms of where it occurs in the supply chain. Poor infrastructure for post-harvest storage, handling and distribution are the primary reasons why food is wasted in developing countries. On the contrary, in developed countries, while significant amounts of food are lost early in the supply chain due to out-grading from superficial appearance standards or unfavorable market conditions, negligent consumer behavior is responsible for the largest share of waste (Figure 1). According to Gustavsson et al. (2011), consumers in developed countries waste approximately 95-115 kg/capita/year, whereas consumers in developing countries waste only 6-11 kg/capita/year.

Figure 1. Food lost or wasted by region and stage in value chain, 2009 (percent of kcal lost and wasted)
Source: Lipinski et al. (2013) based on FAO (2011)



In the United States (US), since 1974 waste has increased by 50 percent along the food supply chain and amounted to losses of 1400 kcal/capita/day, or 150 trillion kcal/year in 2009 (Hall et al., 2009). In 2012, the US produced 518 billion pounds (or 235 billion kg) of food, of which 45 percent was lost or wasted (Toth & Dou, 2016). Consumers were responsible for 47 percent (i.e., 110 billion pounds) of wasted food, while retail was responsible for 19 percent (i.e., 45 billion pounds) (Toth & Dou, 2016). The total economic value of food waste at the retail and consumer level in the United States is worth a staggering $165.6 billion, or $390/capita/year (Buzby & Hyman, 2012). Over half of the total consumer