

Title Post-harvest food wastage reduction in fruit and vegetables through cold chain collaboration: A theoretical framework

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Abstract

The issue of food wastage, including that of fruit and vegetables, has significantly hampered the efforts to combat hunger, raise income and improve food availability. In a recent study on "Food and Agriculture", it is reported that as much as one third of all food produced for human consumption, which equates to 1.3 billion tons, is lost in the supply chain before or after it reaches the consumer, globally. Such wastage has high impact on the economy, environment and the value of the food itself. This problem certainly adds to the huge challenge of feeding a projected population of 9.2 billion by 2050. Increasing food production and reducing waste through efficiency improvement across the entire food supply chain are some of the means to address this issue. Cold supply chain (or cold chain in short) helps preserve the freshness of post-harvest fresh food from source until they are purchased by the consumers. Owing to the unique characteristics of the operation and specifications, cold chain invests heavily on technologies to help maintain temperature during transport, trace, and monitor the delivery so as to ensure product quality. However, as a result of fragmented operation and lack of coordination, deficiency, abuse or fluctuation in temperature control along the cold chain is quite common. Absence of clear and consistent guidelines for material handling also leads to bruising, rotting, aging and wilting. These not only increase deterioration of the product, but can also trigger safety issues. Many studies have found that supply chain collaboration can allow companies to leverage on the expertise and experience of others on an operational basis so that together they perform better than they do separately. Despite the many studies on supply chain collaboration and the many positives derived from them, research on cold chain collaboration seems to be minimal. This study attempts to review thoroughly the extant literature on cold chain issues and supply chain collaboration with a view to developing a collaboration framework for cold chain underpinned by appropriate management theories. It is expected that collaboration among firms in a cold chain, if proves successful, will help meet temperature specifications at every point in the chain thereby minimizing damage and ensuring quality of product. It will also enhance overall efficiency and responsiveness of the cold chain through optimization and lead time reduction. These improvements will significantly reduce the current amount of

wastage of fruit and vegetables delivered via cold chain and lessen the problem of global food shortage.