A Comparison of Information Technology Usage across Supply Chains: A Comparison of the U.S. Beef Industry and the U.S. Food Industry

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ABSTRACT

Historically, the growth of the beef industry has been hampered by various entities, i.e., breeders, cow-calf producers, stockers, backgrounders, processors, etc..., within the beef industry’s supply chain. The primary obstacles to growth are the large numbers of participants in the upstream side of the supply chain and the lack of coordination between them. Over the last decade significant advances have been made in information and communication technologies, and many new companies have been founded to promote these technical advances. This research looks at both the upstream and downstream participants to determine the degree to which information technologies are currently being utilized and the degree that these new technologies have driven performance improvements in the beef industry’s supply chain. Through surveys, the authors find that the beef industry does not use information technologies to their benefit and that the US beef supply chain is not yet strategically poised to enable the use of these technologies.

Keywords: Beef Industry, Business Management, Coordination, Food Manufacturing, Information Systems, Information Technology, Supply Chain

INTRODUCTION AND BACKGROUND

In a study of the U.S. beef industry and the use of information technology (IT) to enable the industry’s supply chain, Neureuther and Kenyon (2008) found that the beef industry is not using IT to any significant advantage except in the area of information collection. They further found that IT could enhance supply chain performance and integration, but the supply chain is not yet strategically poised to do so. They attributed this to several reasons:

1. Beef in the U.S. is thought of as a commodity product

DOI: 10.4018/jisscm.2010100103
2. The U.S. beef industry lacks a common vision and industry goals.
3. The mentality of downstream partners in the supply chain constrains incentives and information movement to upper levels in the supply chain.
4. In addition, auction houses have developed into information clearinghouses for much of the information in the supply chain and few are using e-markets or e-commerce tools.
5. Mistrust of internet usage dominates the industry where there is a feeling that small producers may be eliminated by adopting IT.
6. Current supply chain entities partners perceive little or no benefit to moving their processes online with respect to cost savings in procurement.

Based on these findings, they made several recommendations for the beef industry in the area of IT use in the supply chain and with respect to infrastructure changes that will need to occur in order to enable the use of IT. A synopsis of the recommendation is found in Table 1.

Given these conditions in the upstream portion of the Beef Industry’s supply chain, it would make sense then, to look at the US beef industry and compare its readiness for the use of IT to that of other food industries. To this avail, this research will examine the use of IT in the food manufacturing industry, using the 2003-2007 Industry Week/MPI Census of US Manufacturers. Specifically, the research will examine the usage of using information technologies in food manufacturing supply chains by examining the impact of information technologies and supply chain performance measures. In the analysis, profitability, costs of goods sold, labor costs, material costs, and overhead costs will be analyzed with each of the technology platforms of enterprise resource planning (ERP and ERP II), demand planning and forecasting (DPF), electronic data interchange (EDI), online purchasing (OP) and online selling (OS). The results will then be compared to the US beef industry.

**OBJECTIVES**

Even though a solid foundation of supply chain research exists (Chandra & Kumar, 2000; Levy & Grewal, 2000; Mentzer, Dewit, Keebler, Min, Nix, Smith, & Zacharia, 2001; Lambert, Cooper, & Pagh, 1998; Langley & Holcomb, 1992; Min & Mentzer, 2000; Chandrashekar & Schary, 1999; Cooper, Lambert, & Pagh, 1997; Croxton, Garcia-Dastugue, Lambert, & Rodgers, 2001) there is inconsistent evidence that any

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**Table 1. Beef industry IT recommendations (Neureuther & Kenyon, 2008)**

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<th>IT Usage</th>
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<td>Increase the use of e-markets and e-commerce for auction houses in order to create visibility and reach, reduce transaction costs, and facilitate asset swap to achieve better utilization of key assets</td>
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<td>Create tangible rewards for adherence to standards, such as contracts that require a higher price per pound for beef that meets an agreed upon level of supply and/or an agreed upon grade specification</td>
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<td>The use of electronic data interchange (EDI) technologies (or even internet XML applications) to link animal record keeping information throughout the supply chain – from cow/calf producer to retailer – by individual animal</td>
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<td>Begin enabling IT at the downstream partners and then pull usage to the upstream participants.</td>
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<th>Infrastructure</th>
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<td>Coordination mechanisms need to be matched to the market structure in order to improve value</td>
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<td>Better communication of consumer demands needs to occur throughout the supply chain</td>
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<td>Better education of the typical rancher of supply chain management benefits, especially in the areas of coordination, vertical integration, and IT usage is a must</td>
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