

# RFID's Impact at Wal-Mart Greater Than Expected

Early estimates of RFID's ability to lower out-of-stocks were too low, according to the University of Arkansas.

By Jonathan Collins

May 4, 2006—Early estimates that pegged the impact of EPC radio frequency identification tags in cutting out-of-stocks (OOS) at [Wal-Mart](#) at 16 percent were too low, according to the [University of Arkansas](#). Researchers at the university carried out an independent study and announced initial results in October 2005, concluding with the 16 percent figure.

"That 16 percent you have heard so much about—it was a conservative estimate," said Bill Hardgrave, director of the university's RFID Research Center. "Now, by looking at the velocity of sales, or how many units are sold per day, we can see where EPC is making a difference." At a session at the [RFID Journal LIVE!](#) conference in Las Vegas this week, Hardgrave presented an updated report on the impact of tracking cases of goods with RFID tags carrying Electronic Product Codes (EPCs).

During the 29-week study, which ended in mid-September 2005, university researchers collected the out-of-stock rates on approximately 4,000 stock-keeping units (SKUs) at 12 pilot stores equipped with RFID technology, as well as 12 control stores without the technology. Researchers chose specific SKUs being outfitted with tags at the case and pallet level by Wal-Mart's top suppliers, analyzing the effect of tagging on those products. The university then announced the group's initial finding in October 2005 (see [EPC Reduces Out-of-Stocks at Wal-Mart](#)).

Further analysis of the data, however, has since revealed which areas and products can deliver the most positive results of bringing down out-of-stocks caused by poor inventory management within a store. Retail-industry studies estimate that in-store inefficiencies contribute 25 percent of out-of-stock situations, with total OOS rates in retail stores representing 8 percent of merchandise.

The new analysis found no improvement using RFID on slow-moving items selling at an average rate of 0.1 units per day. However, for those selling at a rate of 0.1 to 2 units a day, the use of RFID reduced out-of-stocks by 32 percent. The greatest benefit, however, came from goods that sold 6 to 15 units a day. For such items, the data showed a 62 percent decrease in out-of-stocks. Despite this, the highest-volume sales items—which sold at a rate of more than 15 units daily—also saw no improvement in product availability from using RFID.

Hardgrave noted that while the faster-moving goods saw the highest increase in product availability, 90 percent of the studied products selling at a rate of 1 to 3 units a day registered a 32 percent decrease in out-of-stocks using EPC. "Imagine if the bulk of the tagging was in the 6-to-15 rate," Hardgrave commented.

The department in which goods were displayed also had an effect on the benefit of RFID tagging in OOS

situations caused by in-store errors. For example, tagging cases of goods really made no difference in the electronics department, said Hardgrave.

Researchers compared out-of-stock rates in the RFID-enabled stores against the baseline data established at the start of the study. They also examined the OOS rates at the control stores and those of SKUs not tracked with RFID at the RFID-enabled stores.

The RFID-enabled stores receive SKUs tagged at the case and pallet level from either Wal-Mart's own distribution centers, or directly from suppliers. The decrease in out-of-stocks comes from using RFID to monitor how many cases have arrived at the store and how many have been brought out to the shelves, then comparing that information with the number of items from those cases that have been sold (Wal-Mart uses conventional point-of-sale data to determine sales).

By using RFID to track inventory still in its back room, Wal-Mart has been able to automate the addition of tagged products to pick lists for restocking store shelves. Without such automation, sales staff might overlook inventory in the back room, unnecessarily order more stock and leave the store shelf empty of the product while waiting for the new order to be processed and delivered.

"That can create a bullwhip effect in the supply chain. One case is no big deal. But for 10 million cases a day, that can be a big problem," said Hardgrave. "What Wal-Mart has done was simple. It used RFID data to add one key piece of information: Do we have it in the backroom? It's just a little tiny tweak—it didn't change the way it stocks shelves or the printout of the pick list—but the impact is phenomenal."

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