

## **ASHRAE History Article - Ice-Refrigerated Railroad Cars**

By the late nineteenth Century, top speeds for railroad engines were approaching 60 mph. Despite this, transporting livestock to markets east of Chicago was still a very inefficient process. Given the limited rendering technology of the day, nearly half of any live animal was waste. For this reason Gustavus Swift perfected and built ice-refrigerated railroad cars, in large numbers, in the late 1880's. Combined with the increasing speed of rail transit, this made it possible to finally bring fresh meat, slaughtered in the mid-west, to east coast markets. By the turn of the twentieth Century, Swift & Co. had over 100,000 of these cars in operation.

Because these cars required replenishment of their ice bunkers, en-route to market, a new industry was born. Beyond this, once the new product reached its destination, it would still have to be kept cold, so other industries would soon follow. The availability of inexpensive refrigeration would make it possible for the produce and meat of the American plains to reach the population of the eastern states in useable condition.

By the mid 1920's, artificial ice production per person in the US was over 650 lbs. per year. For certain towns along the main railroad routes, ice production was over ten times that rate, because these were the key stops en-route to eastern markets. The average train would use about 500 tons of ice, sprinkled with 5 tons of salt. The process of icing a train could take as long as four hours. A typical railroad car icing station would need nearly 40,000 tons of ice a year, much more than any pond, canal or lake could provide. At the end of the rail route there was the requirement for ice for further cooling of meat and produce, so each eastern destination city would have extensive need for refrigeration facilities.

Next: The advent of the household refrigerator