

The Locomotive

Reducing Spoilage Risks in Perishable Goods Storage

By Dirk Watson, The Hartford Steam Boiler Inspection and Insurance Company

Introduction

The first thing that comes to mind for most of us when we think about spoilage is an image of the contents of our refrigerator the last time we had an extended power outage or the compressor burned out. Ice cream in a puddle on the bottom of the freezer, wilted lettuce in the vegetable drawer, sour milk and melted butter. Now magnify this several hundred times over and you will begin to get an idea of what a typical commercial cold storage or supermarket spoilage loss looks like.

Empty Shelves, Extra Expense

Aside from the trouble and expense of cleaning up the mess, there are issues with disposal, restocking and lost sales. I once asked a supermarket manager what his biggest headache was when dealing with a spoilage loss and I was surprised at his answer — customer perception. He was most concerned about the negative impression left by empty shelves and mop buckets next to the freezer case. A close second was the interruption of daily operations. Deliveries and restocking slowed to a crawl during the cleanup.

In commercial cold storage, it is not unusual to have to move the product into refrigerated vans or even across town to another facility during the cleanup. Disposal of spoiled

product, aside from being costly, can often involve government agencies. Due to high bacterial levels, spoiled product is often deemed hazardous waste, the disposal of which may require considerable bureaucratic red tape.

While the trouble and expense of a spoilage loss goes well beyond inconvenience, there is another, even greater concern. That is the risk of spoiled or contaminated product reaching the consumer. We have all read in the newspapers about multi-million-dollar lawsuits resulting from the consumption of tainted products in the marketplace. The resulting liability can easily turn a once profitable business into a candidate for Chapter 11 reorganization.

Protecting the Product

So what can facility operators do to prevent the headaches and expense associated with spoilage?

To answer this question, we should understand the basic functional needs of commercial cold storage and supermarkets. From those needs, we can develop procedures to protect the product from the moment it is received until it goes out the door.



Hartford Steam Boiler

© 1996-2013 The Hartford Steam Boiler Inspection and Insurance Company
All rights reserved. <http://www.hsb.com/TheLocomotive>

All recommendations are general guidelines and are not intended to be exhaustive or complete, nor are they designed to replace information or instructions from the manufacturer of our equipment. Contact your equipment service representative or manufacturer with questions.

Beyond generating revenue, the most basic operating needs of commercial and supermarket cold storage are:

- To verify and document the condition of the product upon receipt.
- To maintain product quality.
- To control operating and inventory costs.
- To minimize losses.

Each of these needs is linked, directly or indirectly, to the need to prevent spoilage.

Confirmation of product quality at the time the product is received is a fundamental part of today's fast paced inventory control process. The facility needs to be able to identify poor quality product so that the product can be quickly replaced and arrangements made to return or dispose of the substandard product.

Inspect and Review

A thorough receiving inspection combined with a review of transport temperature records is the best way to prevent poor quality product from becoming part of your inventory. The nature of the product and its packaging influence how receiving inspections are performed. Visual inspection for damage to packaging, swells, discoloration and other indications of product mishandling is the most common means of confirming product acceptability. Except when used to evaluate fresh meats and produce, visual inspections often yield insufficient information about the exposure of the product to unsafe storage conditions.

The limitations of visual inspections makes continuous monitoring and recording of storage conditions, combined with point-of-origin quality assurance, an essential part of verifying product quality. Many trucking companies today rely on miniature, solid-state temperature recording devices to confirm whether proper storage conditions were maintained during transport. These matchbook-sized devices are inexpensive and provide high-resolution temperature readings over the entire duration of the transport period. The use of miniature temperature recorders benefits both the

trucking company and its customers by eliminating guesswork.

Maintain Quality

With the quality of the received products established by inspection and review of temperature documentation, the facility's primary focus is then on maintaining proper storage conditions. Ensuring reliable operation of the equipment used to maintain normal storage conditions is the cornerstone of spoilage prevention. This is achieved through a combination of well thought-out system design, balanced operation and disciplined preventive maintenance practices.

It is important for management to take an active role in the operation and maintenance of these systems. By developing a basic understanding of how these systems work, management is better equipped to evaluate the work performed by their equipment service vendors and to make informed budgeting decisions that can improve system reliability and performance.

Control Costs, Minimize Losses

Our claims experience at Hartford Steam Boiler clearly shows that a direct relationship exists between the quality of preventive maintenance practices and the size and frequency of equipment-related losses. In addition to ensuring reliable operation, good preventive maintenance helps ensure efficient operation, extends equipment life and reduces energy costs.

By far the majority of spoilage losses are the result of undetected loss of refrigeration. In most instances, the spoilage occurs over a period of less than 24 hours and when personnel are not present to detect the problem. The rate at which spoilage can occur is dependent upon a number of variables. These include the amount of time the storage space can maintain temperature during a refrigeration outage, the perishable character of the products involved, ambient (outside) temperatures, and the nature of equipment operation during the spoilage period.

As a general rule, the lower the average storage temperature and the larger the storage space, the more slowly spoilage is likely to develop. This is because the thermal mass of the product acts as a “safety net” to prevent spoilage. Smaller storage spaces, like display cases or small walk-in coolers and freezers, can experience a spoilage loss in just a matter of hours. This is particularly likely if the equipment gets “stuck” in a defrost mode of operation, resulting in the continuous transfer of heat into the space.

Temperature Alarms

The use of automated temperature alarm systems offers an inexpensive solution to the problem of undetected loss of refrigeration. These systems use temperature sensors to provide instantaneous warning whenever space conditions stray from ideal.

In addition to generating temperature alarms, state-of-the-art temperature monitoring provides a continuous record of space temperatures. Many of these systems are capable of reading and recording space temperatures hour-by-hour and saving the temperature data on a computer disk. In addition to being a valuable troubleshooting tool, the stored temperature data can help avoid product liability disputes by providing proof that proper storage temperatures were maintained.

It is important that facilities using automated temperature alarms do not become complacent or over-confident that equipment problems will always trigger an alarm. These systems, like all other electrical or mechanical systems, can and do fail. Regular manual (backup) temperature readings combined with routine maintenance and testing serves as a second line of defense against potential equipment problems.

Considering the relatively low cost of purchasing and installing temperature alarms, combined with the reduced likelihood of having a spoilage loss, the use of temperature alarms makes good business sense.

Inventory Control

The final step in spoilage prevention is attention to product condition and shelf life during the storage period. Most often, this aspect of product protection is a part of the facility’s inventory control process. Technological advances provide ever more efficient means of tracking product lots based on date of manufacture or product expiration date. Bar coding and other forms of product identification have markedly reduced the risk of shipping or selling “expired” products.

Emphasis on reducing inventory through just-in-time delivery of perishable goods also helps lessen the likelihood of the use or sale of substandard goods.

Routine inspection of products while in storage, much like the initial receiving inspection, provides a way to identify and separate out damaged or inferior products. In the case of fresh commodities, decisions of when to ship a particular product may hinge almost entirely on the results of in-storage inspections.

Effective Spoilage Loss Prevention

No single step or process improvement will, by itself, prevent spoilage of product. Rather, success in spoilage prevention depends on the conscientious application of each of these measures. Next time you are looking for ways to improve the profitability of your facility, do not make the mistake of underestimating the impact of effective spoilage loss prevention.

About the Author

Dirk Watson has more than a decade of direct experience in the food processing and cold storage industry as a mechanical engineer. As an industry staff consultant for The Hartford Steam Boiler Inspection and Insurance Company, he provides underwriting and claim support throughout the United States. Dirk received a bachelor of science degree in mechanical engineering from California State University, Sacramento, is a commissioned National Board boiler and pressure vessel inspector in three states and is active in professional associations.