

K.S. RANGASAMY COLLEGE OF TECHNOLOGY

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Department of Food Technology

60 FT 603-REFRIGERATION AND COLD CHAIN MANAGEMENT

COLD CHAIN TRACKING

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NEED

The need for temperature tracking solution

- ▶ Ensuring that fresh and frozen produce such as vegetables or ice cream are kept at **appropriate temperatures during all phases of transportation** and storage from manufacturer to consumer, is immensely important for retailers like customers.
- ▶ Customers are **increasingly concerned** about the quality of foods, and failure to guarantee the highest quality at all times can have a **significant impact on the public image** of retailers.
- ▶ As a consequence, retailers must know and **be able to prove** the correct handling of their frozen and cold food products to legal control entities at all times.

Radio-frequency identification (RFID)

- ▶ The quality of these products might can change rapidly, when inadequate temperature and relative humidity conditions during transport and storage.
- ▶ Temperature variations can occur in warehousing, handling and transportation.
- ▶ Studying and analyzing temperature gradients inside refrigeration rooms, containers and trucks is a primary concern of the industry.
- ▶ Any temperature disturbance can undermine the efforts of the whole chain.
- ▶ The supply chain management for temperature sensitive goods requires fast decisions; goods are forwarded within hours.
- ▶ Appropriate planning calls for more information than that which could be provided by standard RFID tracking and tracing.

Radio-frequency identification (**RFID**)

- ▶ Radio-frequency identification (**RFID**) is the wireless use of electromagnetic fields to transfer data, for the purposes of automatically identifying and tracking tags attached to objects.
- ▶ The tags contain electronically stored information. Some tags are powered by electromagnetic induction from magnetic fields produced near the reader.
- ▶ Some types collect energy from the interrogating radio waves and act as a passive transponder.
- ▶ Other types have a local power source such as a battery and may operate at hundreds of meters from the reader

Radio-frequency identification (**RFID**)

- ▶ RFID technologies are said to improve the performance of the cold chain.
- ▶ Recent advances offer vast opportunities for research, development and innovation in the cold chain.
- ▶ This is the consequence of lowering costs of ownership, engineering increasingly smaller sensing devices and the achievements in radio frequency technology and digital circuits.

- ▶ RFID was originally developed for short-range product identification, typically covering the 2 mm - 2 m read range and has been successfully applied to food logistics and supply chain management processes.
- ▶ However, recent developments in RFID hardware outfitted with sensors extend its range of application.
- ▶ Adding sensors to the same tags used to track items moving through the supply chain may also alert if they are not stored at the right temperature and predict the remaining shelf life.
- ▶ There are active and semi-passive tags that can measure temperature, humidity, shock/vibration or light.
- ▶ Moreover, the last generation of Class 4 RFID tags can be configured in a mesh network.
- ▶ In this type of network, the tags can communicate each other to get to a reader circumventing environmental obstacles and extend the size of the system.



Thank You