

## Actionable Insights in Perishables Logistics



A case for condition monitoring over temperature monitoring

# Temperature Monitoring

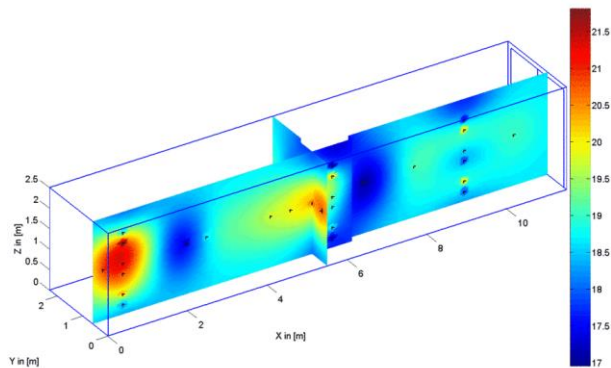
Maintaining recommended temperatures consistently is difficult in practice

1. Been around for nearly 50 years  
simple temperature logging (chart recorders and usb recorders)
2. Many effective offerings for monitoring thresholds of temperatures and identify when these thresholds are breached
3. Reports on temperature breaches delivered in pdf/excel format.
4. Some offer programmable alerts to detect harmful temperature patterns  
10 hours above 8 C; 60 minutes below -1 C
5. Wireless/connected systems now even offer real-time notifications of alerts over sms or email

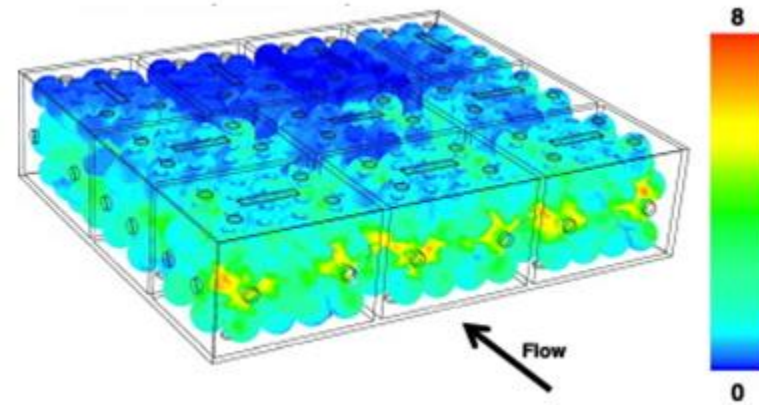
Very effective for procedural compliances and preserving product integrity

# Temperature Monitoring

Spatial variations of temperature experienced in storage rooms and trucks are well understood contribute to variability in product condition within the inventory



Source: intelligentcontainer.com



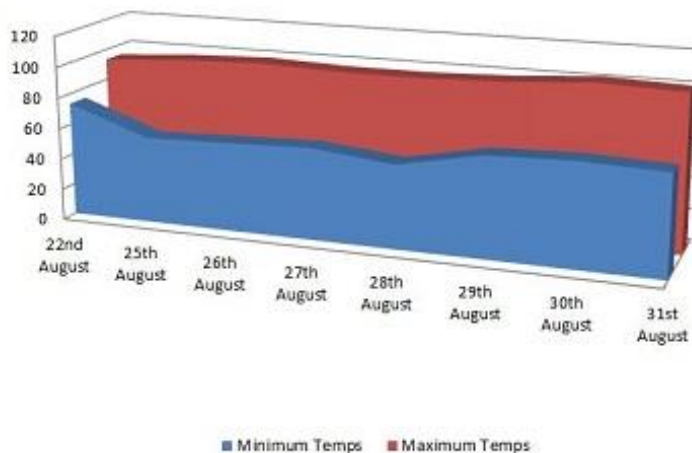
Source: kuleuven.be

# Temperature Monitoring

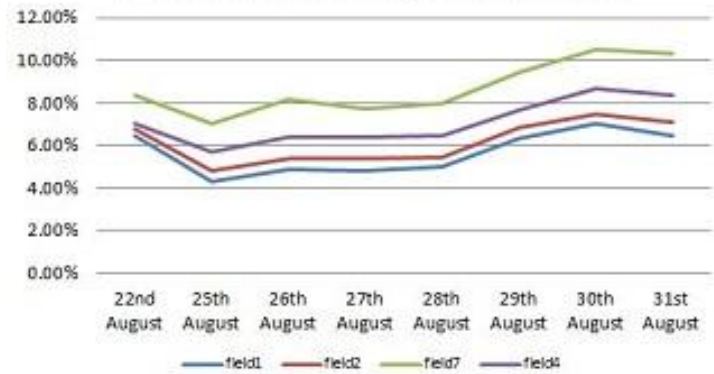
- Variations in diurnal temperatures and its effect on harvest/catch/pick day of products
- Products with the same date of harvest can vary in condition by quite a bit

Delano, CA (2009)

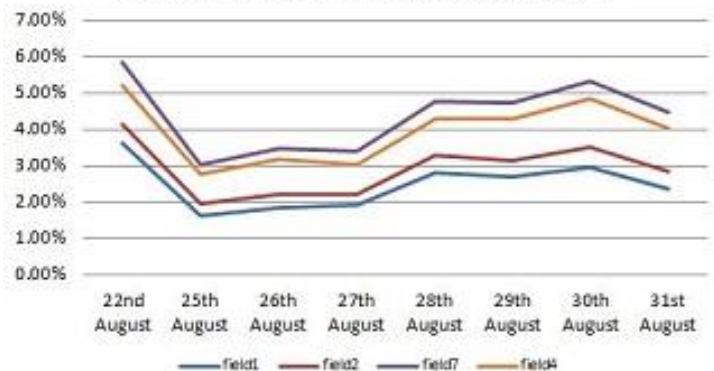
**Daily Temperature Trends**



**Harvest: Shelf Life Lost During the Afternoon Shift**



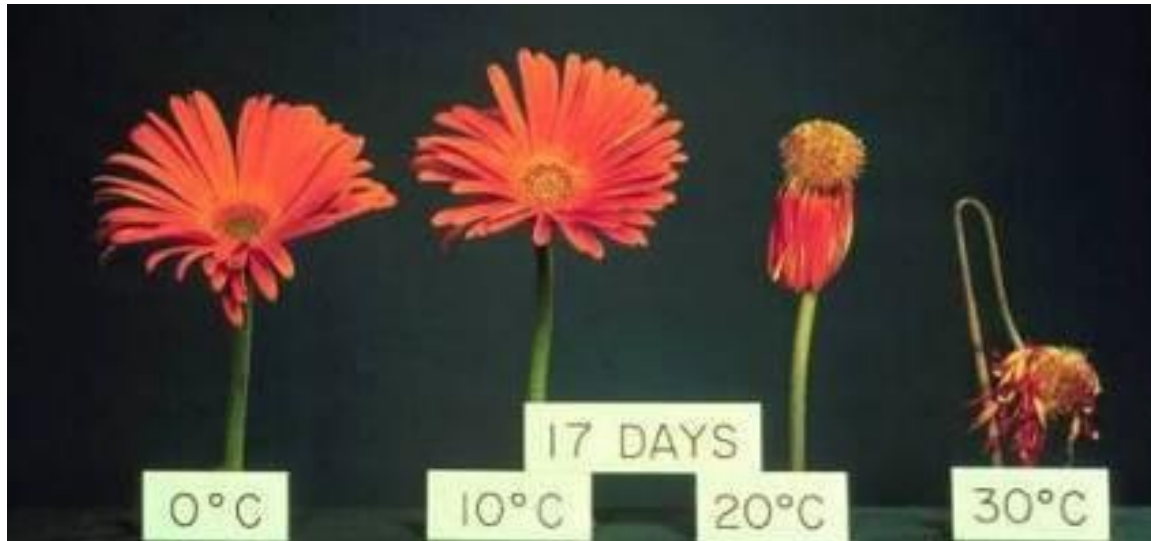
**Harvest: Shelf Life Used During the Morning Shift**



# Condition Monitoring

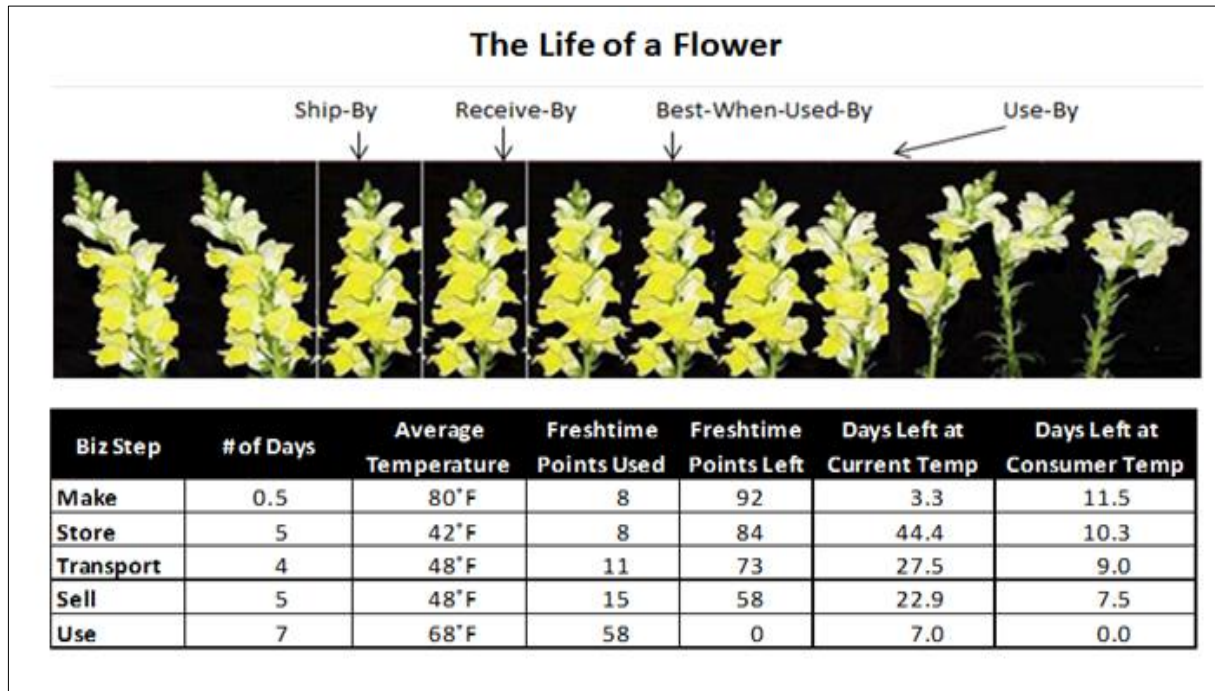
We all know when a flower or food is fresh—by its look, its smell, its feel or its taste. But is it near its peak or about to decline?

## Freshtime Points.



# Condition Monitoring

Temperature monitoring is not sufficient to quantify variability in the condition within the inventory



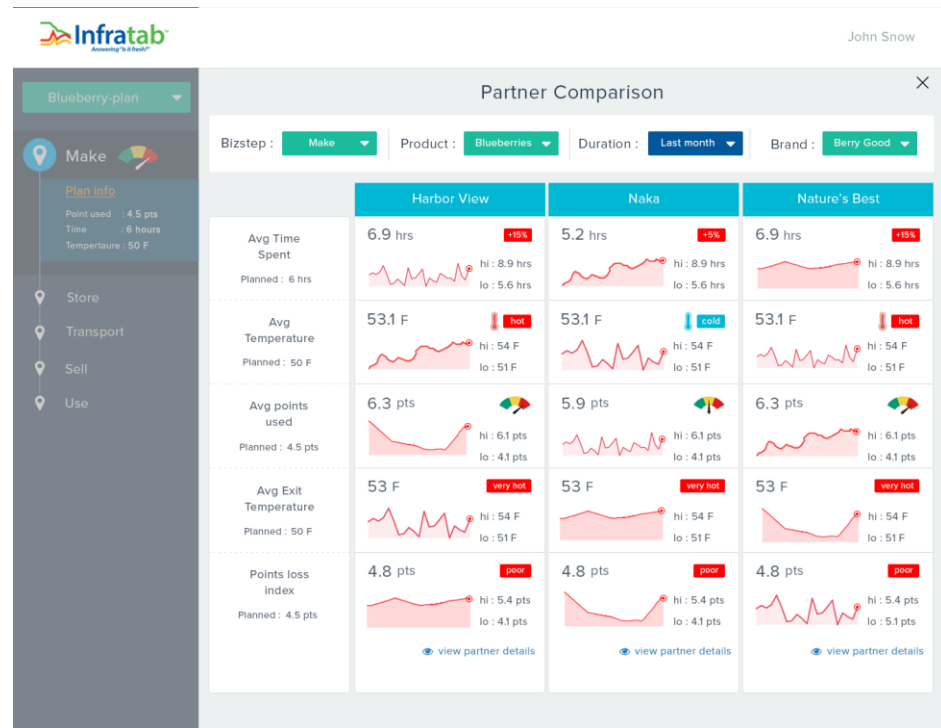
# Condition Monitoring

A partner takes longer time for handling the product, or could not maintain the prescribed temperature or maybe....both?

## Points Loss Index

1. Incoming temperatures
2. Exit temperatures
3. Average temperatures (MKT)
4. Freshtime points used

## Planned vs Actual



Understand the contribution of the partner to the cold chain performance holistically

# Freshtime Planner

Freshtime Planner Halibut Halibut °C/ Hrs Murali

| Business Steps    | Time Duration   | Temperature | Points Remaining              |
|-------------------|-----------------|-------------|-------------------------------|
| <b>Harvest</b>    | <b>103.5Hrs</b> | <b>2°C</b>  | <b>59.3</b> <span>Edit</span> |
| Catch             | 6 Hours         | 50 °F       | 91.2                          |
| Gut               | 1 Hours         | 50 °F       | 89.8                          |
| Ice               | 4 Days          | 34 °F       | 59.5                          |
| Unload            | 0.5 Hours       | 34 °F       | 59.3                          |
| <b>Store-Dock</b> | <b>10Hrs</b>    | <b>1°C</b>  | <b>56.2</b>                   |
| Store-Bins        | 8 Hours         | 34 °F       | 56.8                          |
| Pickup            | 1 Hours         | 34 °F       | 56.5                          |
| In Transit        | 1 Hours         | 34 °F       | 56.2                          |
| <b>Process</b>    | <b>11.3Hrs</b>  | <b>1°C</b>  | <b>52.5</b>                   |
| Head              | 0.1 Hours       | 40 °F       | 56.1                          |
| Rinse             | 0.1 Hours       | 40 °F       | 56.1                          |
| Weigh & Tote      | 0.1 Hours       | 40 °F       | 56                            |
| Store-Bins        | 1 Hours         | 34 °F       | 55.7                          |
| Box               | 1 Hours         | 34 °F       | 55.4                          |

apps.infratab.in Copyright © 2015, Infratab, Inc.

Budget and Plan outcomes at every business process



# A Comparison

## Temperature Loggers (Price range: \$20-\$60)

### Pros

- ✓ A 50-year old technology;
- ✓ Many users, many suppliers;

### Cons

- ✓ A 50-year old technology;
- ✓ Labor intensive: calibration, setup, and data retrieval are one logger at a time;
- ✓ Data is most useful for proving “Not my fault,” but an overload for real-time analytics.

Market leader:



and many other data logger companies:



## Freshtime tags (price range: \$12-\$30)

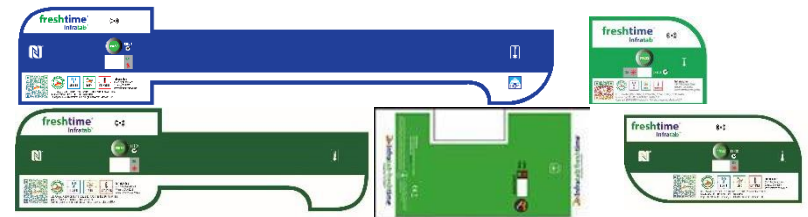
## Freshtime reader (\$40-\$2,000—depending upon # of tags read/minute.)

### Pros

- ✓ Real-time communications integral to tag design: RFID UHF for high volume supply chains, NFC for smartphone users, Dual UHF-NFC and cellular radio (Q4 '16) for mixed uses;
- ✓ Freshness + temperature monitoring;
- ✓ Data: smart, actionable, compressed, secure;
- ✓ GS1-EPCglobal supply chain compliant;
- ✓ Freshtime Points-metrics for quantifying and monetizing freshness;
- ✓ Tags: high-volume enabled: manufacturing, calibration, setup, data retrieval, report creation.

### Cons

- ✓ Freshtime RFID and NFC tags require a reader;
- ✓ New concepts, new technologies, new skill sets.



| Freshtime Tags Key Specs                  |  |
|---|--|
| Memory Available                          | Upto 3000 temperature log,<br>Upto 100 Freshtime points log,<br>512 byte for business data |
| Monitor critical temperature thresholds   | ✓  |
| Connected sensors                         | RFID/NFC & GSM (coming soon)   |
| Programmable temperature alerts           | ✓  |
| Temperature measurement range             | ✓  |
| Temperature accuracy                      | ✓  |
| Programmable start delays                 | ✓  |
| “Start” and “Stop” button                 | ✓  |
| Programmable life and elapsed time alerts | ✓  |
| Visual display                            | Multicolor LED indicator for displaying alerts   |
| Software                                  | Windows 8.1/10 Desktop,<br>Windows Phone 8,<br>Android 4.2+                                |
| Checkpoints/histograms                    | ✓  |

# Freshtime Tags



## WAREHOUSING

### RFID: A Tool For Tracking Products, Assets And More

Food Logistics

BY ELLIOT MARAS ON DEC 17, 2015



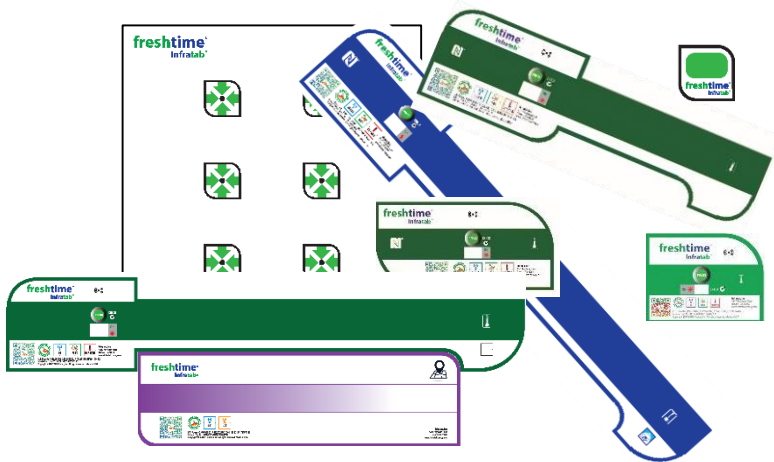
Icicle Seafood uses Infratab's RFID tags to track temperature readings for fish throughout the supply chain.

Freshtime tags fit different needs.

# What makes Freshtime special?

- ✓ *Vision: live dates for items for cents,*
- ✓ *rare mix of skills and people,*
- ✓ *sensor architecture,*
- ✓ **Freshtime Points™,**
- ✓ *commitment to standards (GS1),*
- ✓ *commitment to open, exchangeable and trusted data,*
- ✓ *commitment to a circular economy,*
- ✓ *intellectual property.*

**Sensor architecture:** realization of the vision.



## Freshtime Points: metrics that count.

Value of a Freshtime Point

1 = 2.6 Hours

Freshtime points      Storage Temperature ↓

Value of a Freshtime Point

1 = 0.5 Hours

Freshtime points      Ambient Temperature ↓



# Thank You!

Muralidhar Duvvuri  
Director of Product - Perishables Sciences  
& Analytics,  
Infratab Bangalore,  
6, KH Road, Shantinagar  
Bangalore - 560027  
India

Office - +91 80 6454 3666, Ph - +91 81 4747 0363

[www.Infratab.com](http://www.Infratab.com)  
[muralid@infratab.com](mailto:muralid@infratab.com)

