Warehousing, wholesale and distribution / OD-08

Cold storage: temperature and batch tracking

Continuous temperature logging and expiry-based batch management for fruit, vegetables and other sensitive goods.

The harvest is in. Part of it is lost in storage.

According to World Bank estimates, only a very small share of fruit and vegetables in Uzbekistan is stored under refrigeration, while post-harvest losses are high. Even where cold storage exists, temperature and batch control determine the level of losses.

Conceptual architecture. No operating results are shown.

01 Sensors	Temperature · Humidity · Door status
02 Alerts	Threshold · Notification · Responsible person
03 Batch	Receipt date · Expiry (FEFO) · Customer
04 Report	Temperature history · Customer report · Losses

At a glance

< 5% — Share of fruit and vegetables stored under refrigeration, according to the World Bank. Around 75% is needed for export competitiveness. [1]

20–30% — Post-harvest losses, according to the World Bank. [1]

$51–58 million — World Bank estimate of private investment potential in cold infrastructure through 2030. [1]

November 2026

01 Evidence and context

Who it is for

Cold storage owner	Temperature and product losses.
Exporter	Temperature history for the buyer.
Warehouse manager	Batches and expiry dates.
Chief power engineer	Refrigeration equipment performance.

Facts and global practice

World Bank

Less than 5% of fruit and vegetables are stored under refrigeration; roughly 75% is needed for export competitiveness. [1]

World Bank

Post-harvest losses are 20–30%. [1]

World Bank

Private investment of USD 51–58 million in cold infrastructure is possible by 2030. [1]

IBC Global

7% of new warehouse demand comes from light industry and multi-temperature formats. [2]

statsnet.co, OKED 52100, 14.11.2026

Among companies in warehousing and storage, many have cold storage indicators in their names (freezer, iceberg, fruit). [3]

The loss figure covers the entire chain, not just storage. Temperature and losses should be measured separately at each warehouse.

02 Where the losses occur

Temperature is recorded manually

The thermometer is checked a few times a day; spikes at night or at weekends go unnoticed.

Batches get mixed

When old and new harvest are stored together, the old batch ships late and spoils.

Who is responsible

If a customer's goods spoil, the warehouse cannot prove the temperature.

Export requirement

When a buyer requests temperature history, there is no data.

How the loss is calculated

Spoiled goods	spoiled kg per period × price per kg
Price markdown	downgraded kg per period × (full price – actual selling price) per kg
Claims	customer claims per period × average claim amount
Energy	refrigeration kWh per period × tariff per kWh

Illustrative calculations; establish the baseline, units and rates during the site assessment. Avoid counting the same loss twice.

Temperature and batches in one system

A sensor in each chamber logs temperature continuously and sends an alert when it goes out of limits. Batches are tracked by receipt date and expiry date.

01 Sensors

Temperature · Humidity · Door status

02 Alerts

Threshold · Notification · Responsible person

03 Batch

Receipt date · Expiry (FEFO) · Customer

04 Report

Temperature history · Customer report · Losses

Modules

WMS: batch and expiry (FEFO)	Receiving, put-away and dispatch by expiry date	Commercially available
Temperature sensors and alerts	Continuous logging, threshold-based alerts	Engineering capability
Customer reporting	Batch and temperature history	Commercially available

Each module has a readiness status. Third-party results are not a forecast for your site.

04 Implementation and measurement

01 Warehouse audit

Chambers, temperature regimes and batches are reviewed.

Output: risk points.

02 Pilot in one chamber

Sensors and batch tracking for one season.

Output: temperature history and loss measurement.

03 Scale-up

Remaining chambers are connected.

Output: the entire warehouse under control.

04 Subscription

Sensors are included in the subscription; the customer does not buy equipment.

Output: monthly report.

What is measured

Out-of-limit events	Number and duration of events	Sensors
Expired batches	Batches dispatched after expiry	WMS
Losses	Spoiled kg / received kg	WMS
Response time	From alert to action	Alert log

What is needed to start

- Warehouse owner or manager
- List of chambers and temperature regimes
- Power and internet availability
- One chamber for the pilot

05 Readiness checklist and next step

01 Is temperature recorded automatically in every chamber?	Yes / No / Unknown
02 If temperature spikes at night, does anyone get alerted?	Yes / No / Unknown
03 Is temperature history kept for at least one season?	Yes / No / Unknown
04 Are batches tracked by receipt date?	Yes / No / Unknown
05 Does the oldest batch ship first?	Yes / No / Unknown
06 Can you provide customers with a temperature report?	Yes / No / Unknown
07 Are losses measured in kg?	Yes / No / Unknown
08 Is it monitored whether doors are left open?	Yes / No / Unknown
09 Has an export buyer requested temperature history?	Yes / No / Unknown
10 Is there a person responsible for this area?	Yes / No / Unknown

What we do not promise

- Exact timeline and price without an audit
- Government decisions and deadlines
- Warehouse space expansion
- Unmeasured results or savings
- Refrigeration equipment repair

Start a cold storage pilot

We set up temperature and batch tracking in one chamber for one season and measure losses.

- Temperature history
- Batch tracking
- Monthly subscription, sensors included

Scope, price and schedule are agreed after reviewing the site and its data.

06 Sources and scope

[1] World Bank, Uzbekistan Private Sector Diagnostic. spot.uz, 17.07.2026.

spot.uz

[2] IBC Global, Central Asia Warehouse Summit (Tashkent). bizmedia.kz, 20.04.2026.

bizmedia.kz

[3] statsnet.co, OKED 52100 (warehousing and storage), 14.11.2026.

statsnet.co

Prepared from the cited sources. Vendor statements and reported sector figures are attributed, not independently verified here. No performance, certification or regulatory outcome is guaranteed. Check the current official rules before making decisions.

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