100+ CAUSES OF DAMAGE TO FRUITS

QUALITY CONTROL

Brix Measures sugar content, indicating fruit maturity and sweetness.

Sugar Determines sweetness and flavor profile, critical for consumer preference.

Net weighty Ensures correct and consistent weight, impacting pricing and trust.

Diameter Gives an indication of fruit size, maturity, and meets specific market requirements.

Colour Indicates ripeness, variety specifics, and consumer appeal.

Grower Aids in traceability and accountability for quality standards.

Product Different products have unique quality benchmarks, storage needs, and handling requirements.

Variety Different varieties can have varied tastes, shelf lives, and susceptibility to diseases, impacting storage and sale strategies.

Brand Recognizable brands often assure quality, influencing purchase decisions and customer loyalty.

Category Helps in organizing products, aids in inventory management, and defines care and handling procedures.

Date code Indicates the harvest or packing date, ensuring consumers get fresh produce and helps in stock rotation.

Pallet ID Provides traceability, ensuring efficient tracking and handling of batches during transport and storage.

Count Gives an indication of the sample size to determine the extent of damage within a box or carton.

Packaging Attests to the suitability or not of the packaging used.

CAUSES OF DAMAGE

Improper Temperature Settings	Incorrect temperature settings can cause chilling or freezing injury to the fruits.
Inadequate Ventilation	Lack of proper ventilation can lead to ethylene build-up, which hastens ripening and rotting.
High Humidity Levels	High humidity can lead to mold growth and other fungal infections.
Low Humidity Levels	Low humidity can cause moisture loss, resulting in shriveled fruits.
Ethylene Exposure	Ethylene exposure from other produce or faulty ventilation can accelerate ripening and spoilage.
Poor Handling Practices	Rough handling can cause physical damage like bruising and punctures.
Inadequate Pre-Cooling	Fruits that haven't been adequately pre-cooled before shipping retain field heat, which can cause spoilage.
Poorly Stowed Cargo	Improper stowing can lead to crushing or bruising.
Cross-Contamination	Contamination from other cargo or within different fruit types can cause spoilage.
Inadequate Sanitation	Poor sanitation practices can lead to microbial contamination.
Vibration Damage	Continuous vibrations during transit can cause bruising and other injuries.
Pest Infestations	Pests can infiltrate containers and cause significant damage.
Chemical Contamination	Exposure to harmful chemicals can cause contamination or residue on fruits.
Gas Buildup	Buildup of harmful gases other than ethylene can cause spoilage.
Delayed Transit	Delavs in transit can expose fruits to unfavorable conditions for longer periods.
Inadequate Insulation	Poor insulation can cause temperature fluctuations inside the container.
Poor Maintenance of Reefer Units	Lack of maintenance can cause the reefer unit to malfunction.
Incorrect Loading Patterns	Loading fruits in incorrect patterns can cause inadequate airflow and damage.
Contamination from Previous Cargoes	Residues from previous cargoes can cause contamination.
Improper Sealing	Improper sealing of the container can let in outside air, pests, or contaminants.
Overloading	Overloading the container can cause crushing and reduce airflow, leading to spoilage.
Miscommunication	Miscommunication about handling and care can result in improper treatment of the cargo.
Lack of Training	Insufficient training of personnel can lead to mishandling and improper settings.
Improper Packaging	Packaging that doesn't protect the fruit or allow for proper ventilation can cause damage.
Condensation	Condensation can cause wetness, leading to mold growth and other issues.
Incorrect Refrigerant Levels	Insufficient or excessive refrigerant can affect temperature control and air quality.
Uneven Air Distribution	Uneven air distribution can cause temperature imbalances within the container.
Overripe Fruits	Shipping overripe fruits increases the likelihood of spoilage during transit.
Mechanical Breakdowns	Breakdowns of the reefer unit or other svstems can cause unfavorable conditions.
Temperature Fluctuations	Fluctuations in temperature can cause stress to the fruits, leading to spoilage.
Early Harvest	Fruits harvested too early may not withstand the shipping process well.
Lack of Qualitv Control	Absence of quality control checks can allow damaged or diseased fruits to be shipped.
Inadequate Fumigation	Insufficient fumigation can allow pests to survive and damage the fruits.
Failure to Monitor Gas Levels	Failure to monitor and control gases like CO2 and 02 can affect fruit quality.
Lack of Inspection	Not inspecting the cargo before, during, and after transit can lead to unnoticed issues.
Use of Damaged Containers	Using damaged or dirty containers can expose fruits to contaminants and pests.
Incorrect Storage Arrangement	Incorrect arrangement can hinder airflow and cause physical damage.
Variations in Transit Times	Unpredictable transit times can make it difficult to maintain optimal conditions.
Inadequate Disease Control	Lack of disease control measures can allow pathogens to spread.
Excessive Time in Transit	Longer transit times increase the risk of spoilage and other damage.
Inadequate Drainage	Poor drainage can cause water accumulation, leading to mold and other issues.
Abrasion	Fruits rubbing against each other or the container can cause abrasion damage.
Unsanitary Loading/Unloading Areas	Dirty loading/unloading areas can introduce contaminants.
Uncontrolled Atmospheric Gases	Lack of control over atmospheric gases can accelerate ripening or spoilage.
Rust	Rust in the container can contaminate fruits.
Improper Door Seals	Doors not sealing properly can allow external air and pests inside.
Misuse of Controlled Atmosphere	Incorrect use of controlled atmosphere technology can lead to spoilage.
Excessive Compression	Too much weight or pressure on fruits can cause compression damage.
Lack of Temperature Recording	Without temperature recording, it's difficult to identify and fix issues.
Inadequate Air Circulation	Poor air circulation can cause uneven temperature and humidity levels.
Negligence	Negligence in monitoring and maintaining optimal conditions can cause damage.
Lack of Fresh Air Exchange	Insufficient fresh air exchange can lead to buildup of harmful gases.
Substandard Container Quality	Low-quality containers might not maintain the desired internal environment.
Improper Defrosting	Incorrect defrosting procedures can cause temperature fluctuations.
Incorrect Stacking	Incorrect stacking can hinder ventilation and cause phvsical damage.
Inadequate Sealing	Inadequate sealing can let in contaminants and pests.
Unplanned Delays	Unexpected delays can expose fruits to undesirable conditions for longer periods.
Lack of Adequate Inspection	sufficient inspection can allow damaged fruits to be shipped.
Use of Pesticides	Incorrect use of pesticides can leave harmful residues.
Inadequate Fungus and Mold Control	Lack of control measures can allow fungus and mold to damage fruits.
Lack of Real-time Monitoring	Without real-time monitoring, issues may go unnoticed until it's too late.
Improper Container Loading	Incorrect loading can cause damage during transit.
Lack of Pest Control	Insufficient pest control measures can lead to infestations.
Malfunctioning Probes	Faulty probes can provide inaccurate readings, leading to improper temperature or humidity settings.
Broken Cables	Broken cables can cause loss of power or data transmission, affecting the monitoring and control systems.
Poor Vent Settings	Incorrect vent settings can hinder proper air circulation and gas exchange.
Celsius and Fahrenheit Confusion	Mixing up Celsius and Fahrenheit can lead to incorrect temperature settings.
Dented Baffle Plate	A dented baffle plate can disrupt airflow, causing uneven temperature and humidity distribution.
Too Frequent Defrost Cycle	Frequent defrost cycles can cause temperature fluctuations, potentially harming the fruits.
Too Frequent Off Cycle	Frequent off cycles can also cause temperature fluctuations and may affect the desired controlled atmosphere.
Incorrect Set Point	Incorrectly set temperature or humidity set points can create unfavorable conditions for the fruits.
Malfunctioning Fans	Malfunctioning fans can cause inadequate or uneven air circulation.
Faulty Thermostats	Faulty thermostats can provide incorrect temperature readings, affecting the setting adjustments
Blocked Air Return Vents	Blocked vents can disrupt airflow, causing uneven cooling or heating.
Outdated Control Software	Outdated software may not regulate the environment efficiently or may have bugs.
Dirty Evaporator Coils	Dirty coils can affect the efficiency of the cooling system.
Unbalanced Refrigerant Charge	An unbalanced refrigerant charge can affect the cooling efficiency.
Incorrect Pressure Settings	Incorrect pressure settings can affect the efficiency of the cooling svstem.
Fault Temperature Alarms	Malfunctioning alarms may not alert personnel to issues in time to prevent damage.
Incorrect Fruit Loading	Loading fruits in a manner that doesn't account for their specific requirements can cause damage.
Leaking Water or Refrigerant	Leaks can cause wet conditions or affect cooling efficiency.
Misconfigured Control Svstems	Misconfigured svstems can fail to maintain the desired environment conditions.
Hole in Container	Holes can allow external air, pests, or contaminants inside, affecting the internal environment.
Incorrect Ozone Settings	Incorrect ozone settings can either be ineffective in sanitizing the air or too high causing harm to the fruits.
Inefficient Ethylene Absorbers	Poor-performing ethylene absorbers can fail to control ethylene levels, accelerating ripening and spoilage.
Poor Performing Data Loggers	Inaccurate data loggers can lead to misinformed decisions, affecting the quality of the fruits.
Poorly Executed Dual Temperature Regi	Failing to properly increase or reduce temperatures in transit could lead to rejection.
Port Strikes	Strikes can cause delays, leading to extended exposure to unfavorable conditions.
Dropped Container	Dropping a container can cause physical damage to both the container and the fruits inside.
Loading Above Red Load Line	Overloading can strain the container systems and cause physical damage to the fruits.
Fault Humidity Controls	Malfunctioning humidity controls can create too dry or too moist conditions.
Incorrect Gas Concentrations	Incorrect levels of gases like CO2 and 02 can affect fruit quality and shelf life.
Defective Seals	Defective seals can let in outside air and pests or let conditioned air out.
Insufficient Insulation	Insufficient insulation can cause temperature and humidity fluctuations.
Lack of Proper Airflow Management	Improper airflow management can lead to uneven cooling or heating.
Poorly Maintained Cooling Systems	Poor maintenance can lead to inefficiencies or breakdowns in the cooling system.
Incorrectly Calibrated Sensors	Incorrectly calibrated sensors can provide wrong readings, leading to incorrect settings.
Poorly Secured Cargo	Unsecured cargo can move during transit, causing physical damage.
Lack of Proper Pre-Trip Inspections	Missing issues during pre-trip inspections can lead to problems during transit.
Cold Treatment Failure	Failure in administering or maintaining the required cold treatment can result in pest infestations or spoilage due to not meeting the phytosanitary requirements.

DEFECTS

Stem rot Measures sugar content, indicating fruit maturity and sweetness.

Blue mould A fungal infection, predominantly from the Penicillium species, that thrives in cool and humid conditions.

Discolouration Results from factors like oxidation, improper storage, or disease, affecting the fruit's visual appeal.

Blemish These are marks or spots on the fruit, often reducing its market value, though not always affecting taste or nutrition.

Internal browning Caused by factors like cold storage injuries, low oxygen levels, or certain diseases, compromising fruit quality from the inside.

Oleocellosis A condition where oil cells rupture, often due to rough handling, leading to surface discoloration and reducing market appeal.

Bruising Affects appearance, can accelerate decay, and reduces market value.

Mould Indicates spoilage and is unappetizing, making fruits unsellable.

Split Often due to rapid growth or fluctuations in water availability, leading to the skin being unable to stretch with the expanding fruit.

Scar Result from physical injuries in the early growth stages or due to pests and diseases, affecting the external appearance.

Rot Caused by fungal or bacterial infections, it deteriorates the fruit, making it unfit for consumption and reducing its shelf life.

Slip skin Results from detachment of the skin from the fruit pulp.