

CA, MAP & When Gas Matters

When modified or controlled atmospheres extend life — and when wrong O₂/CO₂ bands injure product. Practical guidance for shippers and brokers from USDA AH-66.

ProspectSentinel

~10 min read

USDA AH-66 + HB 669

For shippers & reefer desks

Cold Chain Index

Transit Guide

Executive brief

AH-66 treats controlled atmosphere (CA) storage and modified atmosphere packaging (MAP) as major postharvest technologies: lower O₂ and/or elevated CO₂ can slow respiration and ripening beyond refrigeration alone. Wrong levels cause injury. Transit “atmosphere” also includes ethylene management and simple venting — not every load is a CA room on wheels.

CA vs MAP vs reefer air

MODE	WHAT IT IS	FREIGHT TAKEAWAY
CA storage	Actively maintained gas regime in rooms/containers	Program-level; commodity-specific O ₂ /CO ₂ bands from AH-66
MAP	Package-level atmosphere evolves via film + respiration	Do not crush films; temperature control still king
Reefer venting	Exchange air to manage ethylene/odors/condensation	Operational tool in HB 669 mixed loads

AH-66 emphasizes that beneficial atmospheres are crop-specific. Berries and cherries sometimes use elevated CO₂ in transit contexts noted in Group 1 notes; that is not a license to fog a trailer with random gas.

Where brokers actually touch this

- Honoring shipper CA/MAP program requirements on international or specialty moves.
- Not breaking sealed MAP master packs with forklift abuse.
- Using venting policies that don't destroy humidity on leafy freight.
- Looking up CA notes per commodity in [Cold Chain Index](#) rather than improvising.

Remember priority: temperature → humidity → atmosphere. Atmosphere is powerful and secondary.

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FAQ

- ▶ Is this official USDA guidance?
- ▶ Can I share these with customers?
- ▶ Where are the interactive tools?

Sources & interactive tools

- [USDA AH-66 — The Commercial Storage of Fruits, Vegetables, and Florist and Nursery Stocks \(2016\)](#).
- [USDA AMS HB 669 — Protecting Perishable Foods During Transport by Truck](#)
- **Federal rules (eCFR):** [7 CFR Part 46 — PACA regulations](#) · [49 CFR Part 370 — Principles and practices for the investigation and voluntary disposition of loss and damage claims](#)
- [Cold Chain Index](#) — 200+ commodity storage/transit matrix + co-load checker
- [Produce Shipper Transit Guide](#) — dock setpoints, mix load, checklist
- [Reefer Precool Time Estimator](#) — half-cooling-time style estimator
- [Perishable Claim Analyzer](#) · [PACA Good Arrival Calculator](#) · [Produce Truck Rate Explorer](#)
- [Freight claim package checklist](#) · [Claim / Carmack deadline calculator](#)

IMPORTANT NOTICE

This publication modernizes and explains **public USDA guidance** and, where noted, points to **public federal regulations on eCFR.gov** for educational use by shippers, brokers, carriers, and operators. It is **not** an official USDA or DOT document, and it is **not** legal, insurance, PACA advocacy, food-safety certification, or professional claims advice. Always verify current commodity specifications, contracts, and the *current* eCFR text with the controlling authority and your counsel.

Primary sources: USDA-ARS Agriculture Handbook 66 (2016); USDA-AMS Handbook 669, *Protecting Perishable Foods During Transport by Truck* (1995, reprinted 2008), including Load Compatibility Groups from USDA Marketing Research Report 1070 (Lipton & Harvey, 1977). Selected federal regulation entry points: [7 CFR Part 46 \(PACA\)](#); [49 CFR Part 370 \(freight claims\)](#).

Full series

00 Cold Chain Operating System

01 The Reefer Is Not a Precooler

02 Colder Is Not Safer

03 Ethylene: The Invisible Load Killer

04 USDA Groups 1–8: The Mixed-Load Playbook

05 Airflow, Load Patterns & Multi-Temp Zones

06 Commodity Setpoint Desk Guide

07 Protein, Dairy & Eggs on the Same Trailer

09 From Temperature Log to Claim

10 Seasonal Produce Desk

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