How the Cold Chain Can Help Reduce Food Loss and Greenhouse Gas Emissions

The cold chain can help increase the quality, reach and profitability of kinnow by enabling sales out of season and in distant markets.

INDIA

WORLD'S 2nd LARGEST PRODUCER of fruits & vegetables

but accounts for just **1.5%** of global produce exports

due to losses of up to **20-50%** of total production

KINNOW

Citrus fruit rich in micronutrients, common in the Punjab region of India and Pakistan

4-5°c

SEASONAL: Kinnow is available only **3-4 months** a year

HIGHLY PERISHABLE: Best kept at **4-5° C** and relative humidity of **85-90%**

Increasing yield and acreage - production is too large for local market

The study measured the effects of cold storage and refrigerated transport from Abohar, in northern India, to Bangalore, in southern India, a roughly 2500km overland journey that is a 4-5 day drive by truck.

WITHOUT COLD CHAIN

CULTIVATION → STORAGE → OPEN TRUCK → WET MARKET → CONSUMER

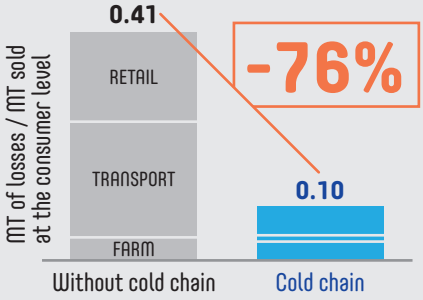
WITH COLD CHAIN

CULTIVATION → PRE-COOLING → COLD STORAGE → REEFER TRUCK → RETAIL → CONSUMER

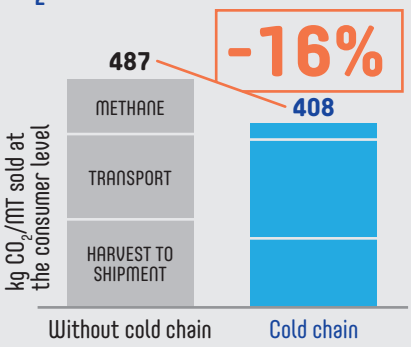
RESULTS

Investment in the cold chain – specifically pre-cooling and transport refrigeration equipment – can reduce food loss **by 76%** and CO_2e emissions **by 16%**

FOOD LOSS REDUCTION



CO_2e EMISSION REDUCTION



PAYBACK

Pre-cooling equipment: **2 YEARS**

Refrigerated trucks: (just over) **4 YEARS**

REACH

Increase in geographical reach of the supply chain with cold chain investment

Bangalore, Russia, Dubai and Bangladesh

PROFITABILITY

Transporter profitability was **23%** based on **2 TRIPS PER MONTH**

from Abohar to Bangalore using the income from the outbound journey with kinnow

For more information about Carrier Transicold, go to **Carrier.com** or follow **@SmartColdChain** on Twitter

Study was conducted by the Indian School of Business under the direction of the National Centre for Cold-chain Development (NCCD) of India, Carrier Transicold India, and in collaboration with Balaji Kinnow