



Cool Chain Group

Cold Chain Management in international food chains

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RUNGIS express AG

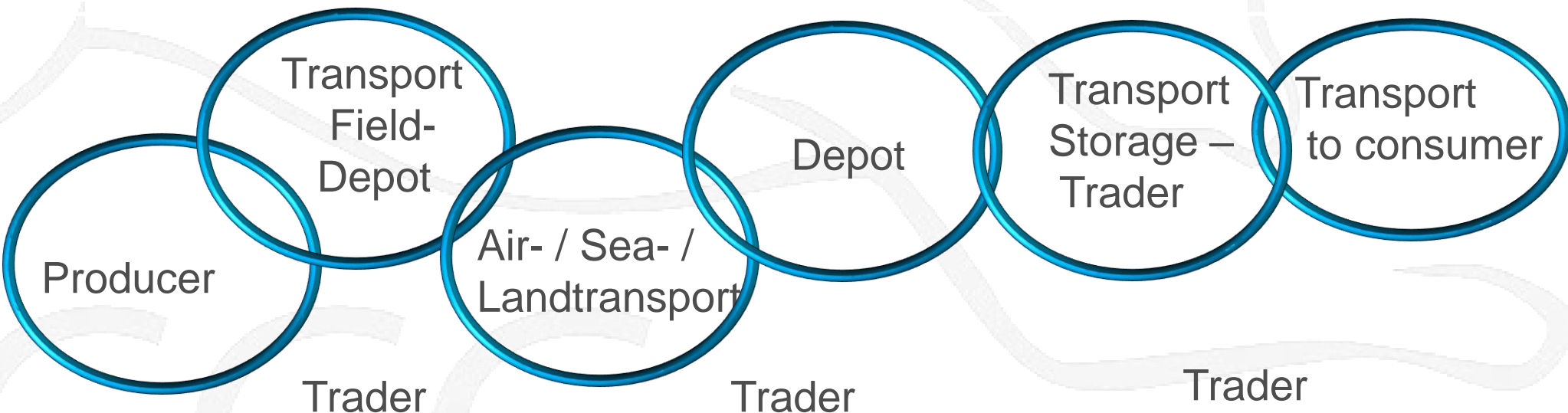
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Importance of the Supply Chain?



Losses are due to

- Wrong handling (temperature, packaging, storage)
- Uncomplete and unreliable forwarding of documents
- Focussing only on the own part of the supply chain, the own profit



Effects of cold chain ruptures

Approx. **35%** of fruits and vegetables are lost in the supply chain⁽⁹⁴⁾

More than **900 million** people are undernourished⁽⁵⁷⁾

Food waste amounts globally to **1.3 billion tons** per year⁽¹⁰³⁾



Prediction of global population to reach **9 billion** by 2050

Food waste emits approx. **4.5 times** of its weight in **CO2** emissions⁽⁵⁷⁾

Food production and transport **highly resource intensive**



Strawberry Trial

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Economic Implications of Strawberry Pre-cooling and Shipping Trials (All US\$)

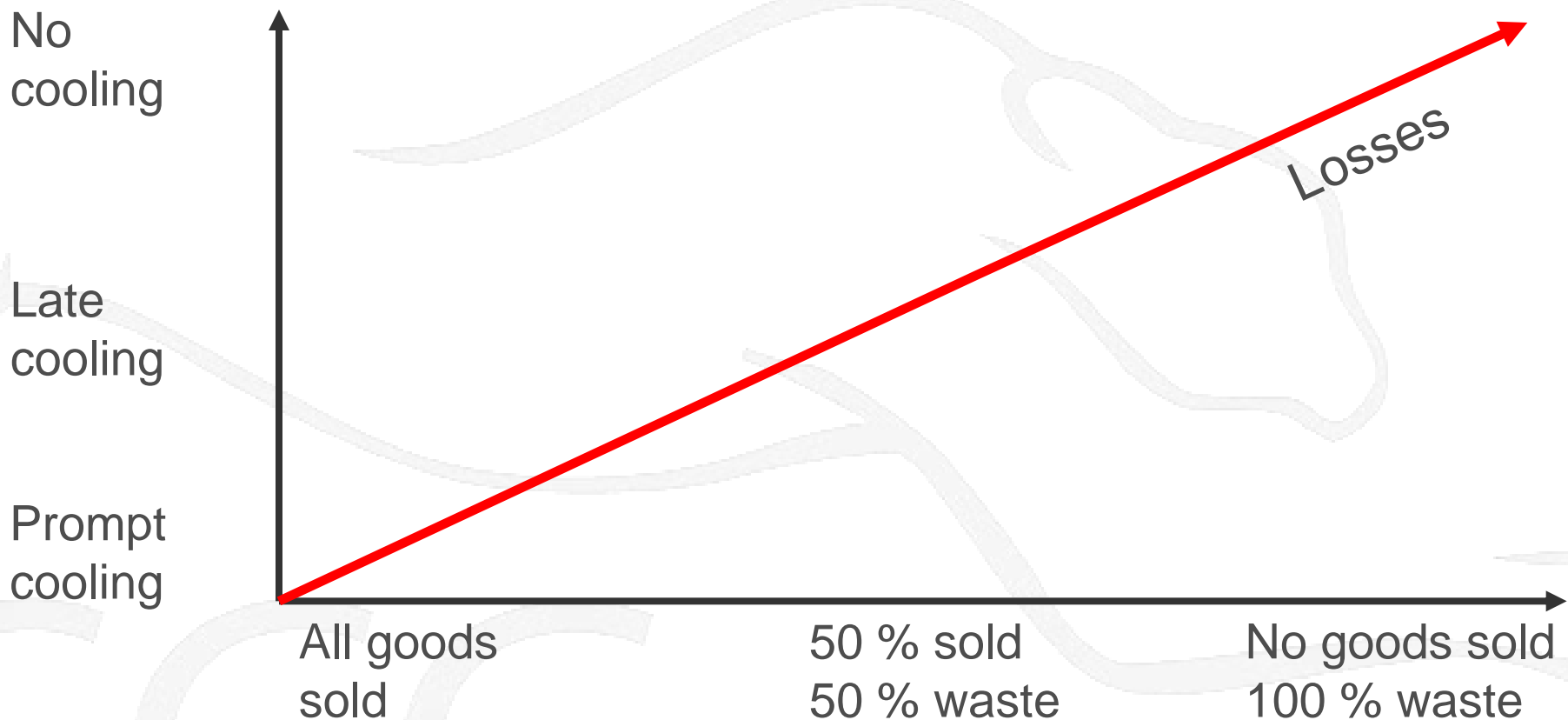
Source: University of Florida IFAS - Dr. Jean Pierre Emond - Research Center for Food Distribution & Retailing (CFDR)

	Full Pre-cool		Partial Pre-cool		No Pre-cool
	No Delay	Partial Delay	No Delay	Partial Delay	N/A
24 pallets per truck 20,736 clamshells \$3.99 Retail, \$1.65 Wholesale					
Arrival Condition at Distribution Center	100%	100%	100%	100%	100%
Day One Condition					
Available for store sales	50.0%	50.0%	50.0%	50.0%	8.3%
Below standards/not able to sell	0.0%	50.0%	33.3%	50.0%	41.7%
Day Two Condition					
Available for store sales	40.0%	0.0%	13.3%	0.0%	0.0%
Below standards/not able to sell	10.0%	0.0%	3.3%	0.0%	50.0%
Sold %	90.0%	50.0%	63.3%	50.0%	8.3%
Waste %	10.0%	50.0%	36.6%	50.0%	91.7%
Maximum Value @ 100% Sales (\$3.99x20,736)	\$82,737	\$82,737	\$82,737	\$82,737	\$82,737
Actual Revenue	\$ 74,463	\$ 41,368	\$ 52,400	\$ 41,368	\$ 6,892
Lost Retail Revenue due to waste \$	\$8,274	\$ 41,369	\$ 30,337	\$ 41,369	\$ 75,845
Wholesale Cost (20,736 @ \$1.65/Clamshell)	\$ 34,214	\$ 34,214	\$ 34,214	\$ 34,214	\$ 34,214
Operating Cost/Overhead Expense	\$ 13,031	\$ 13,031	\$ 13,031	\$ 13,031	\$ 13,031
Shipping Cost Expense	\$ 5,184	\$ 5,184	\$ 5,184	\$ 5,184	\$ 5,184
Net Profit	\$ 22,034	\$ (11,061)	\$ (29)	\$ (11,061)	\$ (45,537)

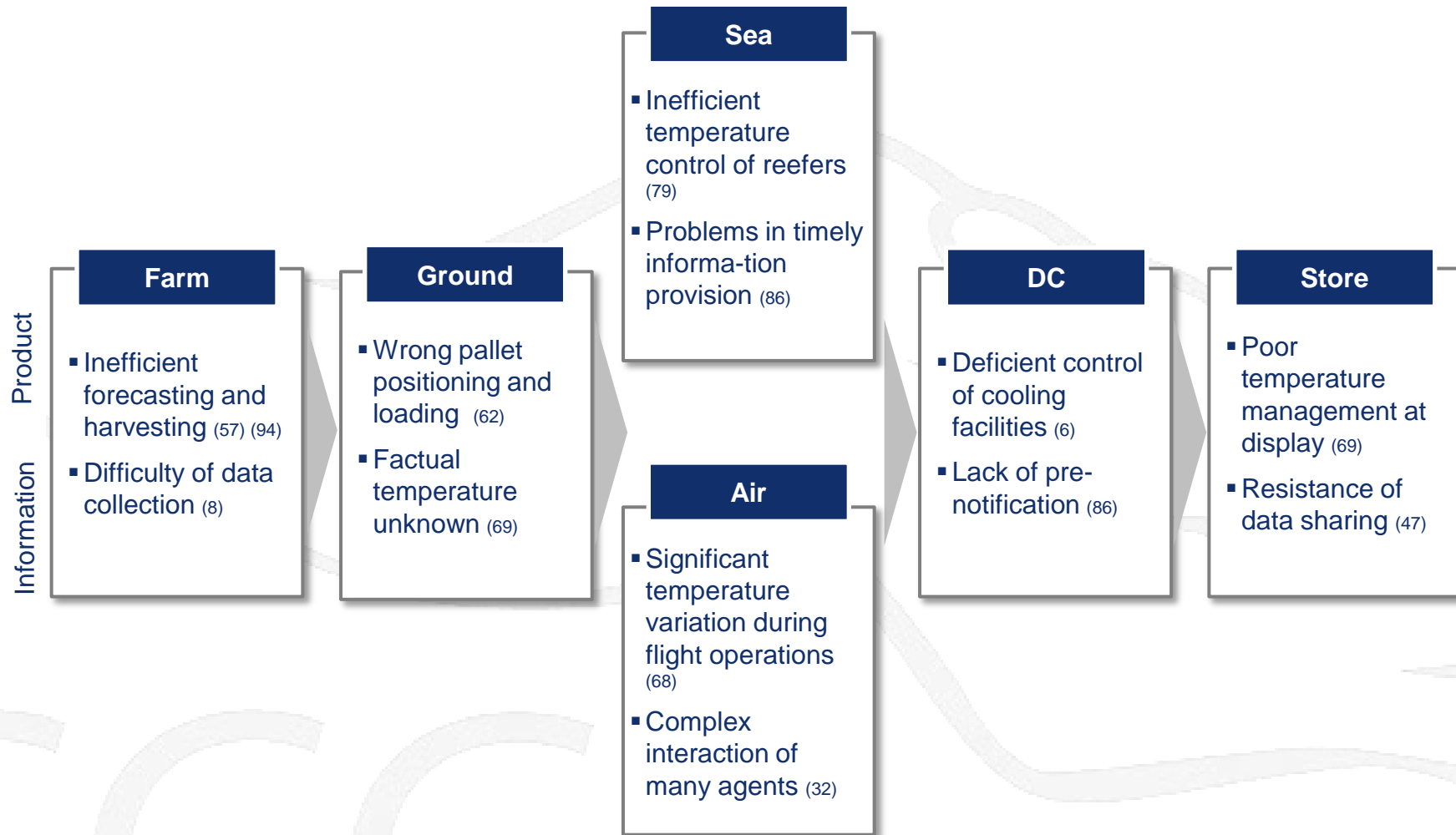
No Delay = No wait in the field. Partial Delay = 3 hours +/- wait in field before pre-cool. Partial Pre-Cool = pre-cooled 50 f only.



Time / Speed of Cooling ↔ Revenues



The key challenges – weak points in every link



Risks caused by an insufficient cold chain

- Out of Stock – goods are not available
- goods arrive in bad condition
- customer gets the wrong product/replacement
- costs are higher than necessary
- causes damages to the image of customers (shops, restaurants)



Conclusion

- One responsible party from production to shelf.
Change purchasing!
- Honest discussion: What is best for us and for the environment?
- Cheapest price is not the best purchasing criterion.



This presentation and its sources are based on:

Hülsmann, M., Brenner, V.: Causes and Effects of Cold Chain Ruptures - Performance of Fragmented versus Integrated Cold Chains.

In: Hülsmann, M. [Ed.]: Scientific Contributions to Strategic Management: Vol. 28. Scientific Series - Systems Management - Jacobs University. Bremen 2011.

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Thank you for listening...