



Efecto sinérgico de la congelación criogénica
y el envasado en atmósfera protectora para
la conservación de alimentos

Synergetic effect of cryogenic freezing and
modified atmosphere packaging for
food preservation

Sonia Guri (CARBUROS METÁLICOS)



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SESSION 5: Latest trends in packaging solutions



El valor de la experiencia
La pasión por el futuro



Who is Carburos Metálicos?



- Founded in 1897
- Part of the Air Products Group since 1995
- 650 employees, 400 contractors and 160 agents
- More than 100.000 customers, 13 production plants, 12 packaged plants and 2 laboratory of special gases
- R & D facilities located in Barcelona



Who is Air Products?

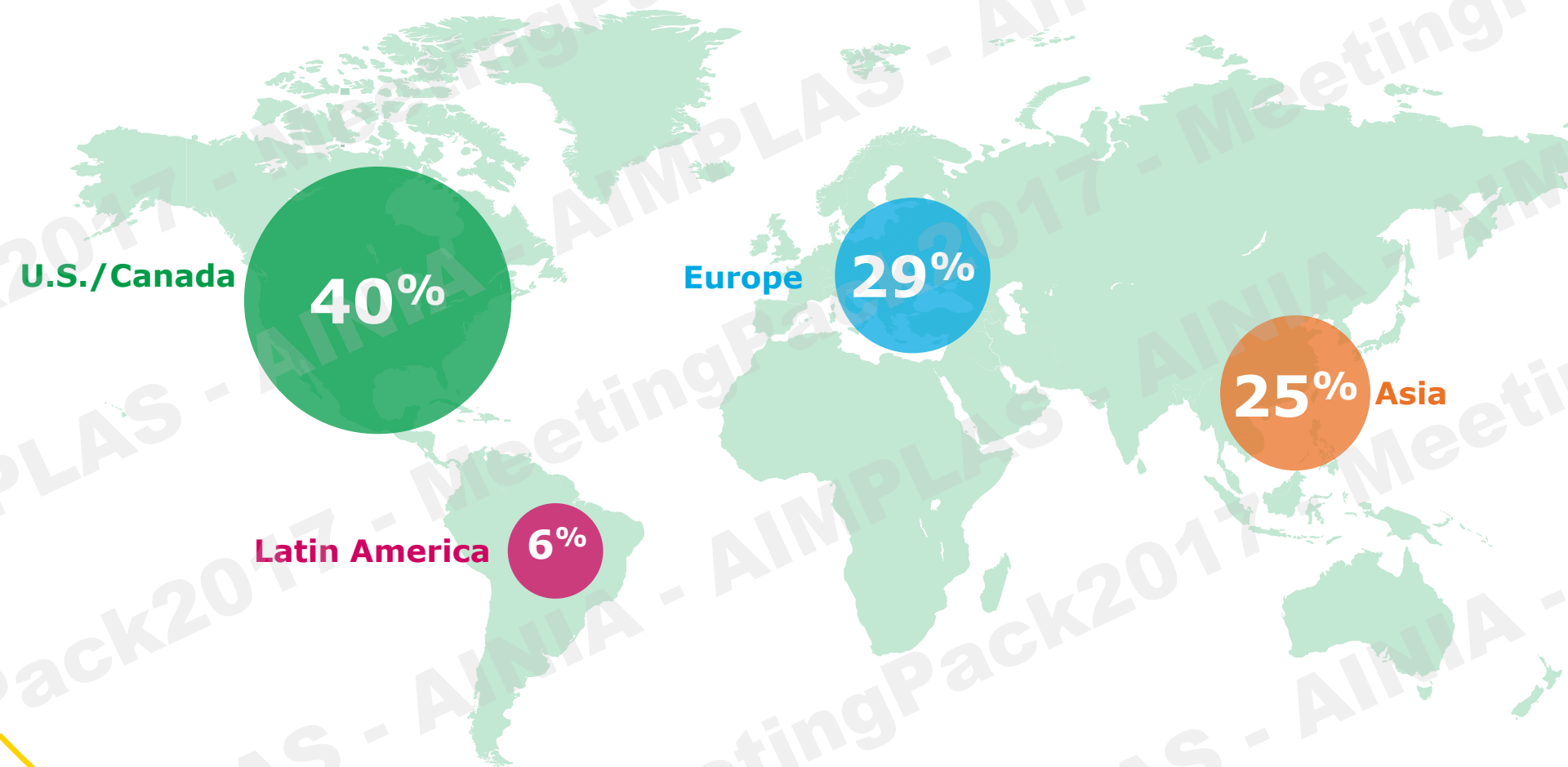


- Founded in 1940 in the USA
- 16,000 employees around the world
- Operations in more than 50 countries
- More than 750 production plants
- Serving a wide range of industries, from food and beverage, health and personal care to energy, petrochemicals and electronics



Air Products global presence

FY16 Sales = \$7.5 billion



Air Products supply modes

FY16 Sales: \$7.5 billion



46%

On-site/Pipeline

- 15-20 year contracts
- Limited volume risk
- Energy pass-through



28%

Liquid Bulk

- 3-5 year contracts
- Local supply chain



16%

Packaged Gas

- Short-term contracts
- Local supply chain



10%

Equipment & Services

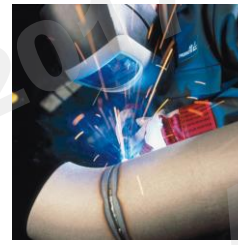
- Sale of equipment
- PO based

In all sectors

Healthcare and Hospitals



Aerospace



Metals

Analitical instruments



Food



Leisure



Petrochemical



Electronics



Water treatment



Food preservation Lab (Barcelona, Spain)



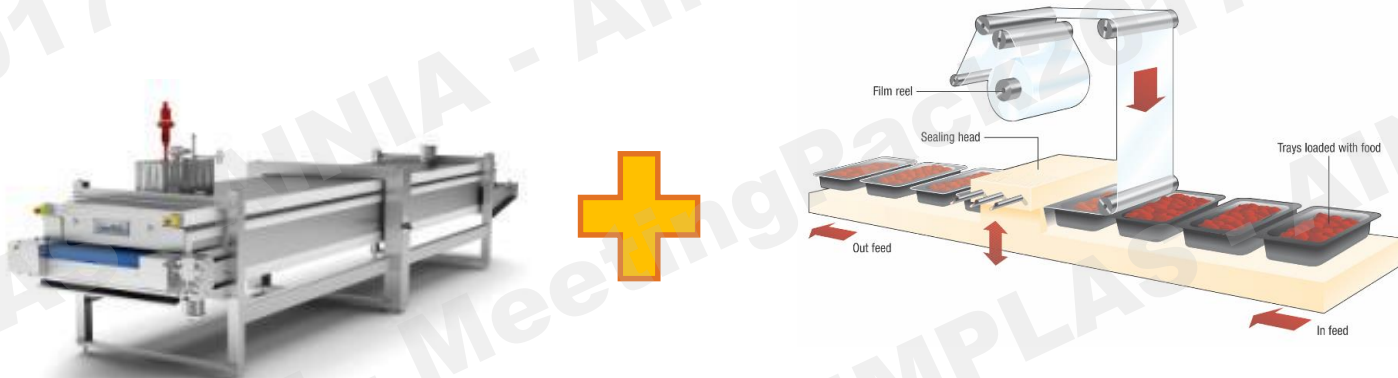
Introduction



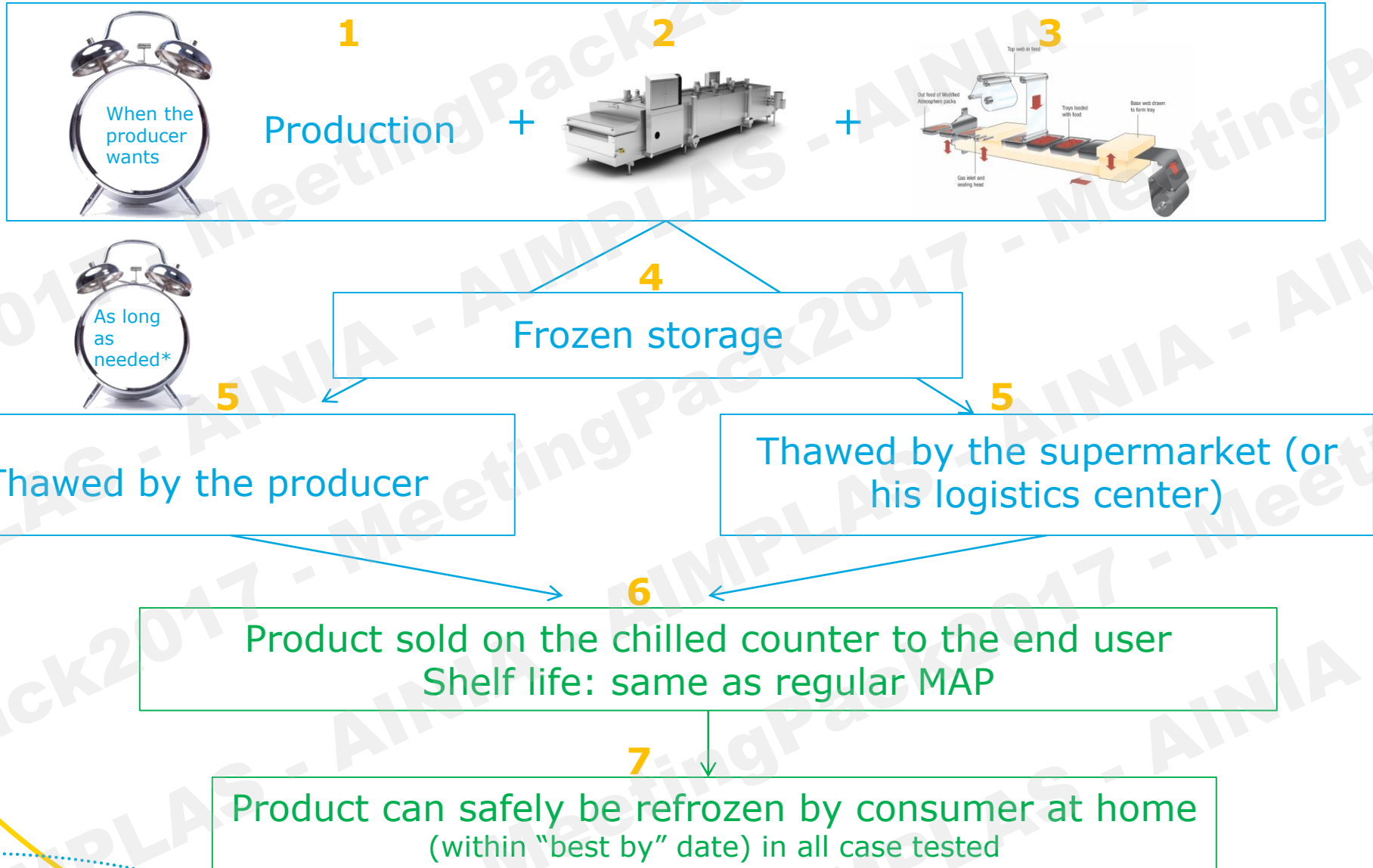
- Frozen foods could deteriorate by a number of different processes:
 - Ready to eat meals have a shelf-life limited by lipid oxidation,
 - red meats by color retention after thawing period and
 - food products in general by microbiological growth.
- An alternative technology to frozen foods could be an initial freezing of a foodstuff with frozen storage being followed by thawing and distribution of the product at chill temperatures
- Modified atmosphere packaging (MAP) is a non-thermal method of food preservation. The proper combination of gases (CO_2 , N_2 , and O_2) in the headspace of food packs results in inhibition of spoilage microorganisms of food products and retention of their sensorial attributes

Objective

- How could one keep chilled food products fresh for longer than standard existing techniques while still offering a quality product?
- The objective of the project was to investigate the combined effects of storing frozen food products under modified atmosphere, to try to avoid the different ways of food deterioration after thawing period and to evaluate its potential suitability for sale as food chilled products



How does it work?



Technical details

Parameters evaluated

- Treatments: **Cryo+MAP, Cryo+Air and MAP**
- Physico-chemical parameters: Headspace gas composition, surface color, acidity, lipid oxidation, drip loss
- Microbiological growth
- Sensorial properties: overall aspect, aroma, taste and texture
- Other verifications
 - May be refrozen
 - Delamination (separation of the product into layers, important for the desalted cod producer)



Technical details

Products tested

- Raw chicken drumsticks
- Paella
- Lasagna Bolognese
- Breaded chicken breast
- Cod steaks
- Grilled vegetables
- Prepared beef with mushrooms
- Ham and cheese pastries
- Fresh cut pineapple



Freshline® Superfresh



- We named this new **patented** solution **Freshline® Superfresh**
- Methodology benefiting from the synergetic effect of combining the use of cryogenic freezing and modified atmosphere packaging to allow food processors to keep their food products sold on the chilled counter fresh, even longer
- This new offering can help food producers:
 - Enter new markets
 - Improve seasonality impact & supply chain challenges
 - Reduce product waste / extend their product's shelf life
 - Improve sustainability
 - Save costs

Freshline® Superfresh

Beneficial for whom?

- Frozen food producer:
 - Enter fresh food market with little change to their processes
- Fresh food producer:
 - Deal with seasonality issues for (parts of) their production (produce when the raw materials are the best or the cheapest for ex.)
 - Offer more flexibility to their customers (retailers)-> Possibility to win the bid over other brands without lowering the price
- Retailer:
 - Reduce product waste by better managing their supply chain (thaw it only once it is needed on the shelf)

Summary:

Freshline® Superfresh vs standard MAP

- Comparable general appearance, taste and texture
- Similar low levels of exudates (drip loss)
- In all cases tested, results showed the product can be refrozen safely (when thawed under the right conditions)
- Same shelf life once they reach the chilled area (and in some cases even a longer one), plus the period when it is kept frozen!





Thank you
tell me more

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