MINTRAC

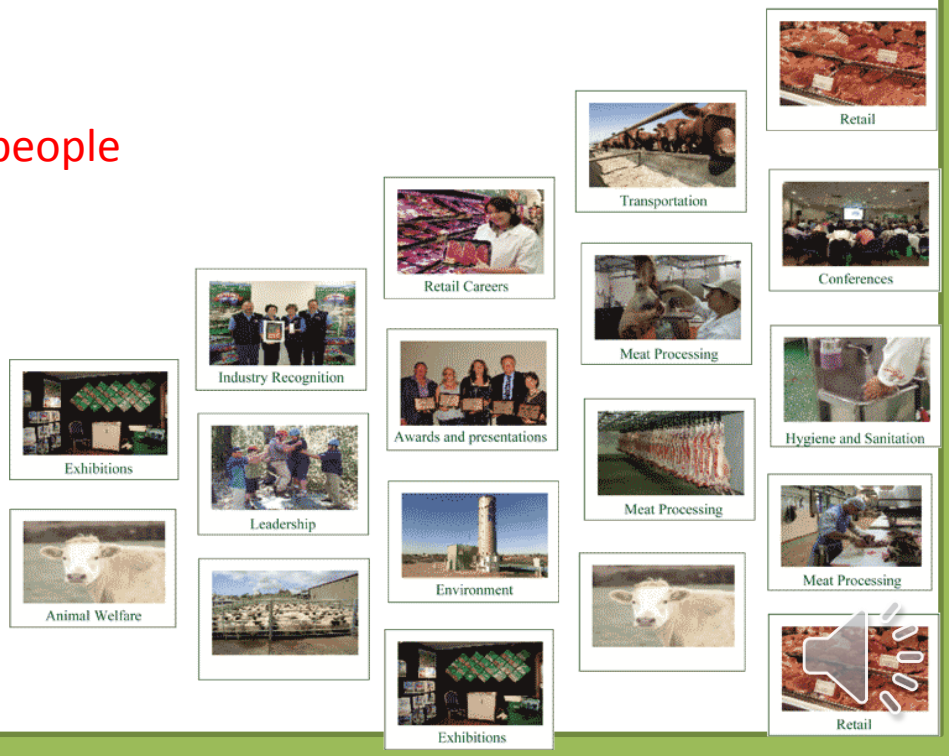
NATIONAL MEAT INDUSTRY TRAINING ADVISORY COUNCIL LIMITED

Unwrapping the Science of Packaging

Quote

"Everyone is gifted, it's just that some people never open the package."

Source : my Dad



How was this steak purchased by the consumer?

We don’t know if was vacuumed packed , fresh, MAP or packaged at all.

That’s what good packaging should do – not have a negative effect on the eating experience

Packaging what is it?

- *Helps Prevent contamination*
- *Helps move products from one point to another*
- *Can make products more appealing*
- *Can aid in extending shelf life*
- *Can help in cross contamination*

- So why do all this ? What are we in the industry for?

Consumers / customers


Retail


Transportation


Conferences


Meat Processing


Hygiene and Sanitation


Awards and presentations

Industry Recognition

Consumers

Driven by a need for convenience, consumers are looking for ready-to-eat or easy to prepare meat products that they can easily fit into their busy lifestyles. At the same time, ongoing financial concerns mean they are looking for both affordable and premium products, depending on the occasion.

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Although variety and taste remain two of the main benefits perceived in meat, research has shown that nutrition and health are now even more valued than is safety

Overall more than half of consumers look at three key aspects when purchasing meat: the use-by/best-before date (68%), the price per kilogram (67%) and the price (67%)

Processors are responding to this demand by developing refrigerated foods that are minimally-processed, high in quality, nutritionally valuable, easy to prepare and have an extended shelf life. By their very nature, however, meat products present a number of challenges to ensuring microbiological quality and safety

Customers What do they look for

- Freshness!
- Value for money
- Perceived quality
- <u>The feel good factor</u>

- How do Consumers get this information?

-Advertising (this is more brand orientated than product specific) e.g. Coles No Hormone Beef etc.

-MSA/MLA promotions (like Australia Lamb ads)

- Pork Ad (get some pork on your fork)

-In store information Butchers or retail staff

- And Labeling

Labelling of packaged foods

But more information to the consumer leads to more issues to be dealt with.

One of the main drivers for change in terms of food labelling regulation has been the increasing amount of food waste. According to a recent report by the Waste and Resources Action Programme (WRAP) UK , an increase of just one day on product life across a range of foods could prevent around 250,000 tonnes of food waste each year, in households and in the supply chain, by giving consumers longer to eat the food they buy.

As a result, there has been increased pressure on the food industry to make changes throughout the supply chain that can extend shelf life.

250,000 tonnes is about

- 13,888 X 20” FCL Reefer Containers

- Or two full container ships

- Or 10.5 million cartons of Beef at 24Kg each

Best before & Use by

Best-before date: determines the length of time a food can be expected to retain its best quality (e.g. flavor, color, texture). Products with best-before dates include canned, dried and frozen foods.

Use-by date: the length of time a food can reasonably be expected to be safe to consume when stored under stated storage conditions. This applies to highly perishable products, including dairy, cooked meats and prepared salads.

Retail

Food waste is and remains one of the main considerations for retailers when it comes to shelf life as it helps them to better control their costs and increase their profit margins.

According to recent figures collected by WRAP (UK), of the 15 million tons of food thrown away in the UK every year, around 200,000 tons comes from retailers as a result of use-by date expirations, product recalls, breakages, and products being taken out of the cold chain.

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In addition to concerns over food waste and profitability, retailers are also increasingly interested in responding to consumer trends such as the demand for clean label and simple ingredient lists.

A 2015 IFIC Food and Health study found that more consumers believe “chemicals” in foods are a bigger food safety concern than pathogens. Attitudes and beliefs

like this further limit the choice of shelf life extension solutions available to their suppliers

Shelf Life

A wide range of factors influences the shelf life of processed meat. Once produced, several physical-chemical and microbiological processes will impact the meat quality over time.

In some cases microorganisms like pathogens can even cause the meat to become unsafe for human consumption.

When it comes to determining the shelf life of a meat product, a distinction is made between intrinsic factors and extrinsic factors.

- Intrinsic factors refer to the characteristics of the meat itself,
- Extrinsic factors are those that refer to the environment surrounding the meat and/or the way it is processed, packaged etc

Intrinsic vs Extrinsic

Factors impacting shelf life

INTRINSIC

Quality of raw material

Product formulation
- Moisture content (a_w)
- pH

Antimicrobials/acids
- Naturally occurring
- Added

Product composition
- Homogenous
- Heterogeneous

Oxygen availability/ redox potential

EXTRINSIC

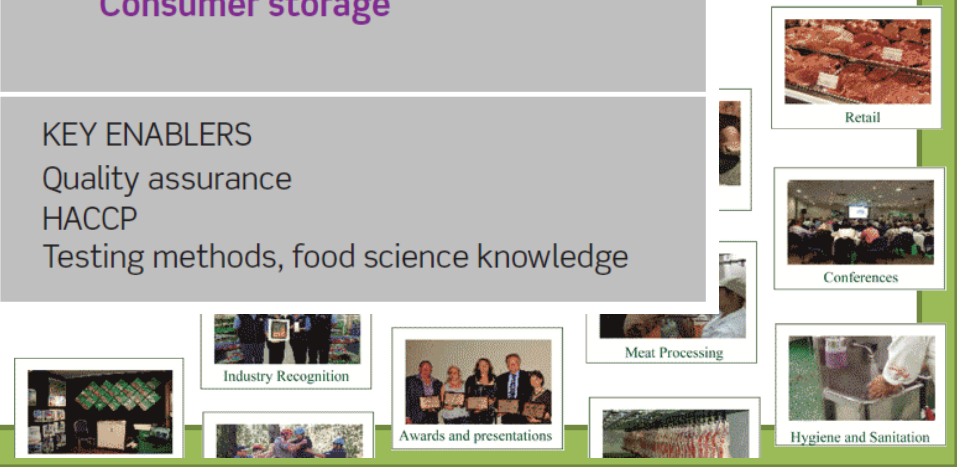
Processing
- Heat treatment
- Pasteurization
- Cooling

Packaging

Storage, storage conditions and distribution

Consumer storage

KEY ENABLERS
Quality assurance
HACCP
Testing methods, food science knowledge



What are these symbols

The Past

- *Butchers Paper*
- *Brown Paper Bags*
- *Old Newspapers*
- *Anything that enables the customer to take the meat home.*

The Present

- *Plastic Bags*
- *Carry Bags*
- *Foam trays (EPS Expanded Polystyrene) Closed cell & open cell*
- *Vacuum Bag (Shrink & pouches)*
- *MAP trays (Modified Atmosphere Packaging) in PP PS & PET*
- *Skin Pack Tray*
- *CPET (Crystallised PET) Dual ovenable trays*
- *Microwave containers*
- *Butcher/Deli Paper*

Present packaging

- ***Poly bags and carry bags***

  Cheap – functional

- ***Foam Trays***

  Cheap- functional

- ***Vacuum Bags Shrink and Pouches***

  Relatively low cost & extends shelf IF used correctly and is subject to the design and make up of structure and requires some additional equipment

- ***MAP & Skin Packaging***

  Little more in cost plus requires additional equipment

  but extends shelf IF used correctly

- ***CPET Trays***

  Enables product to be cooked with in the container in a dry oven and microwave

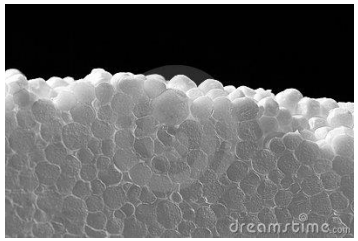
How is packaging made and what does it do

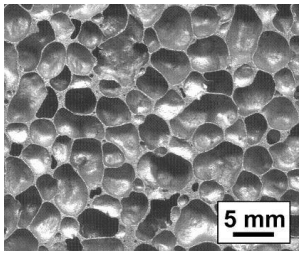
- Poly bags and Carry Bags

HDPE

Foam Trays (Closed and Open Cell)

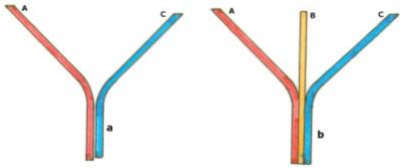
- Foam Trays are usually made from polystyrene and expanded by the use of a gas normally butane or Co2

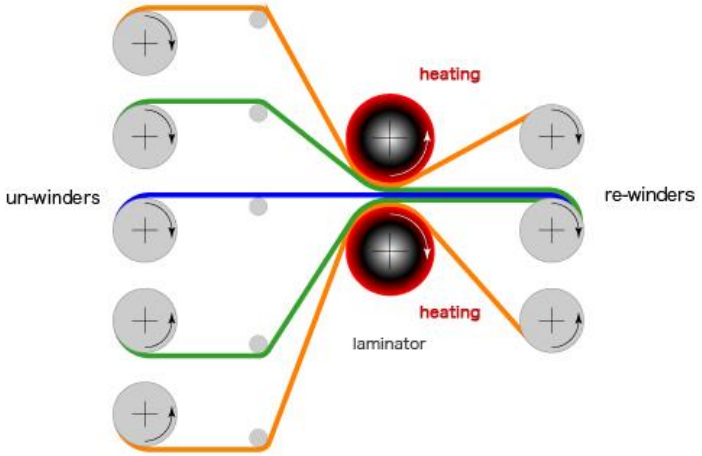




Shrink Bags and Pouches

- Shrink bags and pouches are made by blown extrusion and/or cast





Multilayer for High barrier
PE/TIE/EVOH/TIE/PA/TIE/PE

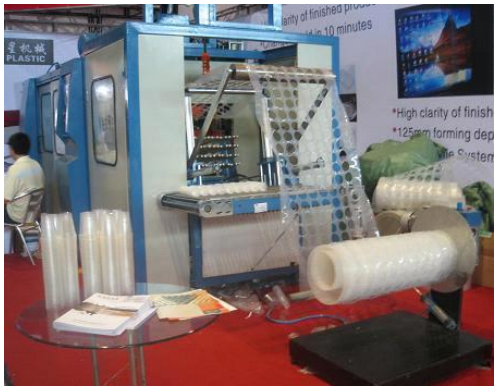
Laminated pouches films etc.

Multilayer High Barrier example

PET/TIE/PE/TIE/PVDC/TIE/PE

MAP Trays and Skin Pack trays

MAP, Skin pack and CPET trays



MAP & Skin Pack Trays

- Base Material for tray can be
- PP or PS or PET
- High Barrier film is laminated the base material

CPET Tray


INTERNATIONAL
Cuisine
400g FROZEN
Beef Lasagne
Prime minced beef and rich tomato, topped with béchamel sauce and tasty cheddar & parmesan cheese
No Artificial COLOURS OR FLAVOURS


VIKING


SHARP


RATIONAL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What should we think about when using packaging

- What & How is it going to be packaged
- Physical condition of the meat before packaging
- Good food safety process
- Equipment to be used
- Temperature control
- Gases used?
- Controls needed

What is correct for each packaging type

- *Plastic Bags*
- *Carry Bags*
- *Foam trays (EPS Expanded Polystyrene) Closed cell & open cell*
- *Vacuum Bag (Shrink & pouches)*
- *MAP trays (Modified Atmosphere Packaging) in PP PS & PET*
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- *Microwave containers*
- *Butcher/Deli Paper*

Red Meat vs Chicken

- Red meat requires high barrier protection
- Poultry require permeable (breathable) structure
- Seafood requires specific films
- Produce (eg Lettuce) require low barrier selective permeable structure to allow for respiration

The Future ?

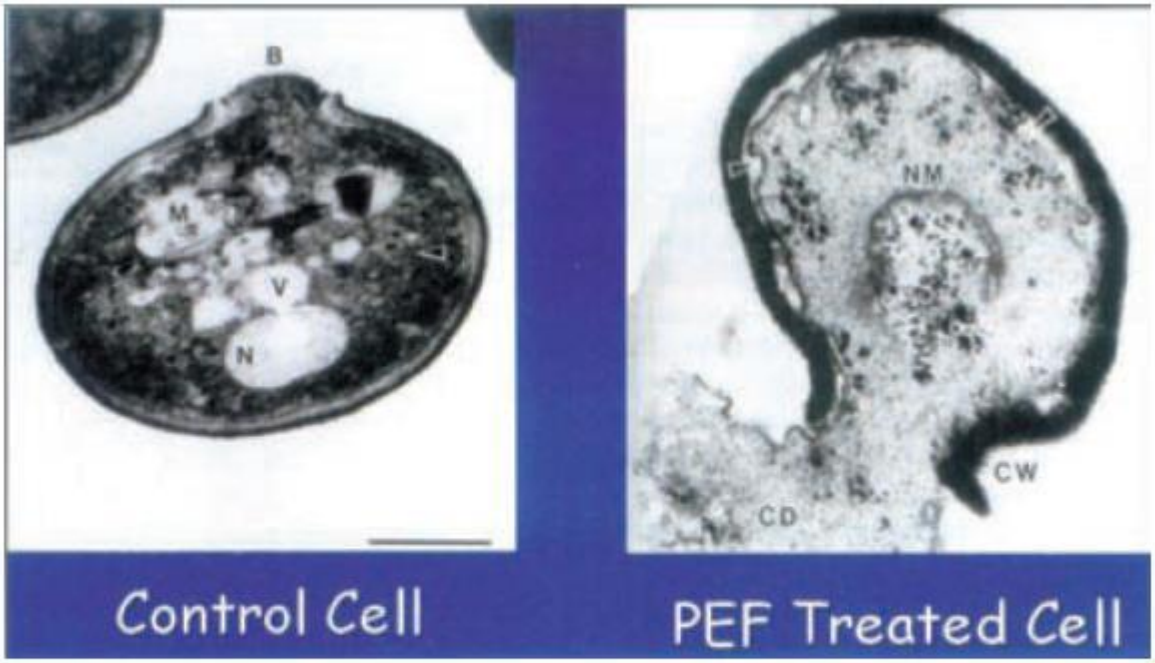
- *Antibacterial Plastics?*
- *Mono polymers ?*
- *Bio Degradable Plastics?*
- *high pressure processing (HPP)*

a method of preserving and sterilizing food in which a product is processed under very high pressure (between 300 and 600 MPa) for several minutes. The high pressure inactivates certain microorganisms, such as spoilage bacteria and enzymes in the food that could lead to its degradation.

- *high intensity pulsed electric field (PEF) processing*

PEF is a non-thermal method of food preservation that uses short (less than 1 second) electric pulses to inactivate harmful microorganisms.

PEF



Picture 1 - Comparing a reference cell (Saccharomyces cerevisiae) with a PEF-treated cell, showing the damage to the cell membrane.
Source: Washington State University, Harrison et al 1996

Remember you can dress mutton as Lamb- but its still Mutton

Thanks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