Selecting the Best Packaging

for Healthy Food & Drink Products

Module Content

1

Module Content

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Product Packaging – A key ingredient for food & drink !

Product packaging is a vitally important component of your product and choosing the right pack for your new concept is a central part of the development process.

It is a crucial area in which science, art, engineering and technology come together, and selecting the optimum packaging should be fully integrated into your concept development from the outset and reviewed and confirmed as suitable at every stage.

This training module looks at the various aspects of physical packaging and can be used in association with our P3-M5 Pack Design module which explains how to work with a design agency and create an impactful design.

You may also find our module on Legal Labelling useful as you progress your chosen packaging.

What is product packaging?

Packaging fulfils many functional and aesthetic roles for your products

Containment

Creating a container which holds the entire contents of the product in a defined space

1

Protection

Ensuring the product is not affected or contaminated by the external environment

2

Transportation

Allowing the product to be transported without becoming damaged

3

Storage

Allowing the product to be held safely throughout its shelf life

4

Communication

Communicating legal and marketing information about your product and brand to consumers

5

Display

Attracting the attention of consumers and ensuring your product is chosen over competitors

6

Packaging Types

Packaging is utilised at three main levels each of which fulfil a different role.

At each level, the essential function of packaging is to protect food products from external influences and damage and contain the food.

Primary Packaging

Packaging handled by the consumer, provides legal & marketing communication
Often has direct contact with the product
e.g. boxes, film, bags, labels, trays, pots, bottles, cartons

Secondary Packaging

Packaging formats used to group together a quantity of primary packaging
Sometimes branded & used for display purposes,
when it is known as SRP (Shelf Ready Packaging)
e.g. Outer boxes, plastic crates, shrink film, base trays and film

Tertiary Packaging

Materials used to group products into larger loads for transportation
Usually removed before products are displayed for sale
e.g. wooden or plastic pallets, pallet wrap

Multiple Functions of Primary Packaging

Protection

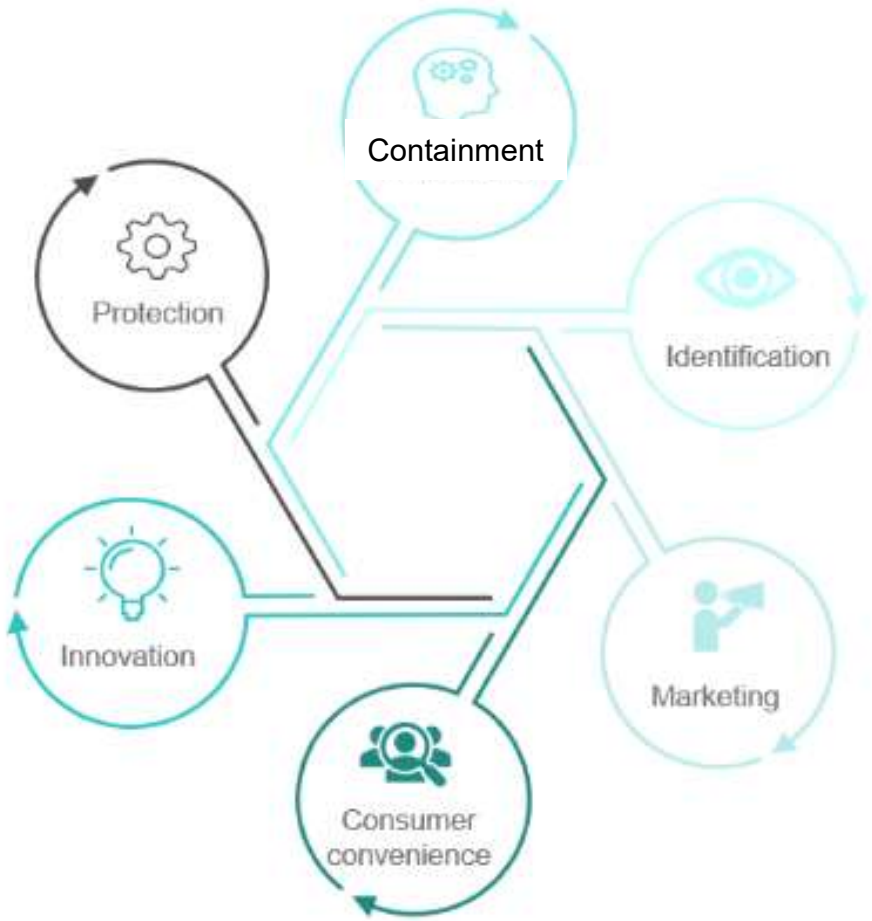
Quality and security of the food product

Containment

Preservation / shelf life
Protection from hazards
Convenience

Identification

Product identification
Labelling
"How to use" Information



Marketing

Communication support
Positioning

Consumer Convenience

Opening / Access to food product

Reliability

Innovation

Facilitates marketing
Technological innovation

Selection Criteria for Packaging Materials

Product Content

Stability and protection (external environmental factors)

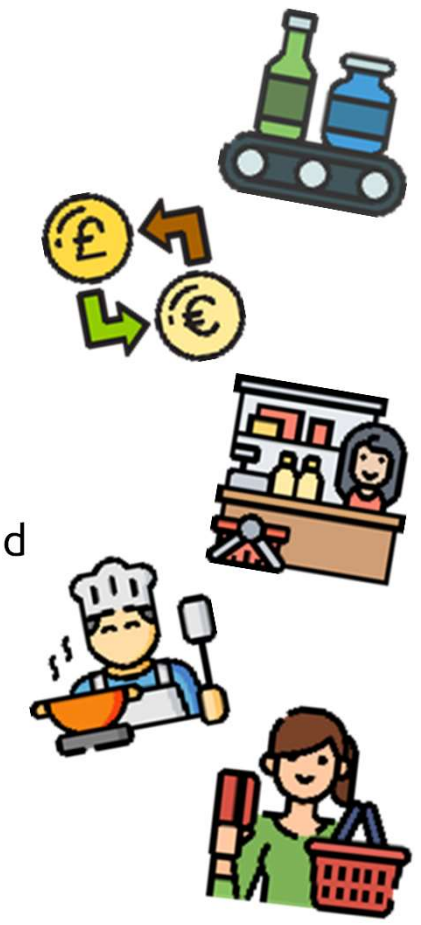
Transport and storage needs

Environmental impact

Consumer acceptability of packaging

Selecting Your Optimum Packaging

When selecting your optimum packaging, it is useful to ask yourself a series of questions, then to answer these and document your findings.
Collating this information allows you to make an informed decision based on the many interconnected factors that will affect your choice of materials and packaging format.



You will want to make your selection to achieve attributes that

1. meet the **practical needs** of your product and packing equipment,
2. comply with your **legal obligations**,
3. are **affordable** given your target sales prices,
4. have **minimum order quantities** or print runs compatible with your anticipated sales volumes
5. **suit the needs** of your retail, wholesale or food service customers
6. **delight** your end consumers
7. positively **promote** your brand image and reflect your brand values
8. **drive sales -** both triggering initial pick up and ensuring repeat purchasing

The following slides suggest some questions you could explore

Selection Criteria – Physical Characteristics

1. What are the **physical characteristics** of your product and what implications does this have ?
For example :-

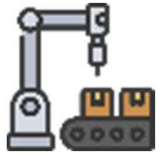
How fragile or prone to damage and deterioration is the product ?

What weight and dimensions of product are you packing per item?

Are you packing multiple components & do they need to be separated or integrated ?

Might the product interact with the packaging – for example if it is highly acidic ?

Might the nature of the product affect the packing process – for example highly viscose products or those with large particulates passing slowly through a depositor ?



What are your target throughput rates per minute for packing and how will this be achieved in your desired packaging on your intended packing equipment ?

Selection Criteria – Functional Needs

2. What are the **functional needs** of your product at each stage of its life – from production, through transportation, storage, display and consumer usage ? For example :-

What **temperature regime** will the product encounter ? Ambient, chilled or frozen ?

Will the primary **packaging fit** in the intended secondary packaging at a cost-effective rate ?

Is the packaging an **integral part of the production process** – such as a metal can in a retort ?

Does the pack need to be hermetically **sealed** to contain a modified atmosphere gas mix ?

How does the **consumer interact** with the packaging – will it be easy-open or resealable ?

Does the **consumer use the packaging** when consuming the product – such as microwaving, oven cooking or pouring boiling water into the pack to rehydrate and consume ?

Does the packaging need to help consumers with **“on the move”** consumption ?

Selection Criteria – Environmental Considerations

3. what **environmental considerations** do you want to address in the materials used & pack disposal

Could you use materials sourced from **recycled content** ?
This often has a much lower carbon footprint that using virgin materials but packaging must meet all the **food safety standards** set out in legislation.

What is the **lowest carbon footprint** possible without compromising the integrity of the packaging ?

Can your packaging be **easily recycled** – meaning that if a realistically accessible recycling method is available to your consumers, nothing in the structure of the pack prevents it being recycled

Compostable packaging is quite a controversial area, as many countries do not actually have a viable composting waste stream and compostable items contaminate the recycling waste stream and are incinerated or sent to landfill, so **thoroughly investigate** the situation where you intend to market your products before proceeding down this route.

Selection Criteria – Visual Impact

4. how will the packaging create the **visual impact** needed to drive product sales

How will the pack be displayed ?

Which “face” will be **presented to the customer** and does the packaging need to stack on shelf ?

Can you **fit on all the legal and marketing information** that is required ?

Will it **remain undamaged** and not become shabby or tatty whilst on display ?

Will your pack **stand out and attract** consumers attention on a crowded fixture ?

How well does the pack **convey your brand image** & **differentiate you** from competitors ?

Is the packaging format **what your consumers expect and want** in your market sector ?

Does the pack **resonate positively** with your target consumers to **drive sales** ?

Safe Packaging

All Food and Drink packaging needs to meet **rigorous food safety criteria**.

Legislation exists to ensure that the public is protected from risks such as **toxicity, contamination or personal injury**.
You will find further details on regulations later in this training module.

Packaging **must not adversely affect** the food or drink it contains – for example through **migration** of microplastic-particles or chemicals, from rust forming in metal containers or particles from the packaging itself becoming a **foreign body contamination hazard**.

It must adequately **keep out any external contaminants**, including dirt, chemicals, pathogens, yeasts and moulds.

It must not be capable of **causing injuries** when used as intended.
For example there must be no sharp edges that could cause cuts, or risks of any part of the pack becoming a **choking hazard** especially when products are targeted at children.

Using Your Information to Select Packaging

Having considered all the relevant aspects of your packaging, you can now **use the information you have gathered** to choose the best packaging for your product, manufacturing processes, customers and consumers.

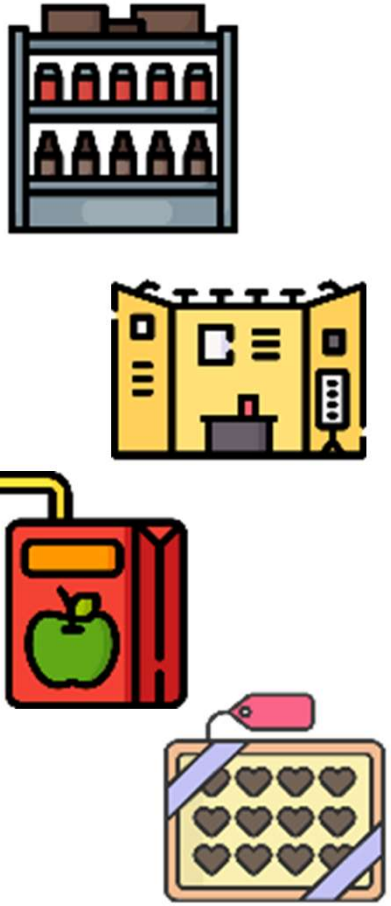
Taking a walk around a large food store, visiting a trade exhibition or conducting online searches are all good places to **seek ideas and inspiration.**

Packaging manufacturers can often support you by offering expert advice and explaining the options they offer, to help you make a good decision.

The following slide is an example of how you might **interpret your information in just one area** when choosing your packaging materials.

You should do this for all the aspects you need to consider.

You may find it helpful **create a grid** which summarises each relevant aspect so that you can map your needs against the options available.



Defining Your Packaging Characteristics

Material Selections – Right for the Conditions the Product will Encounter

The type of materials, and the micron or gauge (thickness) you choose must be **robust** enough to prevent crushing or other damage for the weight of product it contains, in the **conditions** and **temperature regime** appropriate to your product.

For example : a cardboard carton to be used for a frozen product typically needs to be **durable** for a shelf life of over a year when filled with the weight of the product you plan to pack.

Boxes are likely to be **stacked** on top of each other so the materials selected must **maintain structural integrity at -18oC** or colder and be resistant to crushing.
The card must **not absorb moisture** from the surrounding icy conditions and the glue used needs to **tolerate these temperatures** without its molecules shattering and causing the box to fall apart.

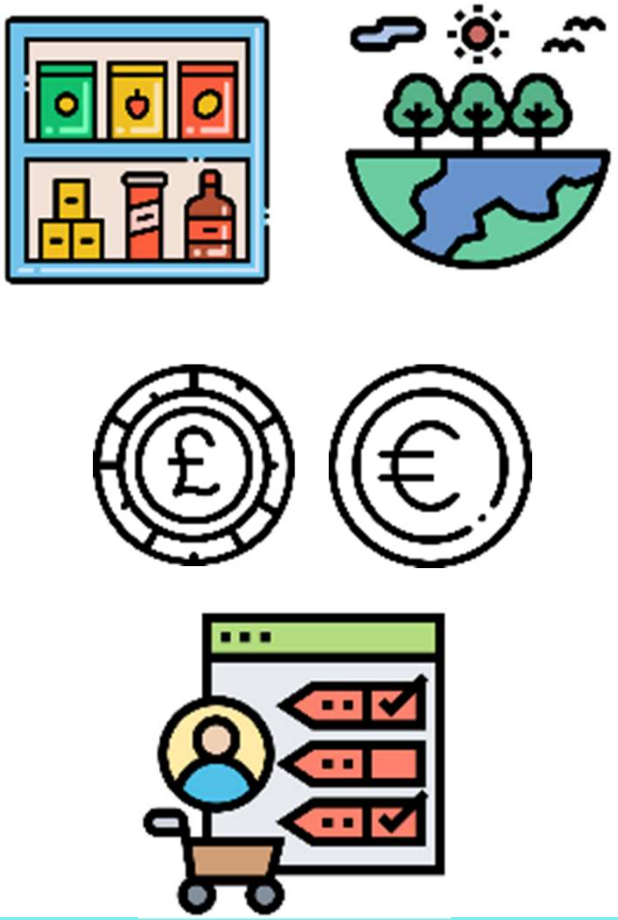
Consideration could be given to using a **freezer grade** rigid plastic tub with lid or film bag as alternative materials which perform well in frozen conditions.

Discuss and Seek Feedback

It can be a good idea to **discuss your suggested options** with potential customers and explore how well your options fit in with their business needs including

the **merchandising space** available,
their **environmental policies**,
cost price expectations.

And **seeking feedback** from your target consumers can save you making expensive mistakes by choosing a packaging option which will not appeal to consumers and drive strong sales !



Packaging Materials

Plastic Materials

- Plastic is the material most frequently used for food packaging

- Plastics were traditionally produced from fossil fuel sources, but new “bioplastics” can now also be created from renewable plant materials. These mimic the molecular structures of traditional plastics and are not necessarily bio-degradable.

- The most common plastic materials are :
    - Olefins;
    - Polyolefins;
    - Polyesters;
    - Ethylene copolymers;
    - Polyamides.

Plastic Packaging - Advantages & Disadvantages

Advantages	Disadvantages
Highly functional – waterproof & moisture resistant, can provide hermetic seals & barrier protection for gas retention	Traditional plastics are manufactured from fossil fuel sources which are **not renewable**
Protective – provides high levels of food safety preventing chemical and foreign body contamination	Plastic food packaging has been recorded as contributing significantly to marine & land-based **littering**
Robust – maintains structure and is capable of surviving impacts when specified to a sufficiently thick micron, can protect food from damage & liquids from leaking	Plastics breakdown into **micro-plastic particles which contaminate** oceans, rivers, the atmosphere and land and ultimately enter the human food chain
Adaptable & Versatile – can be moulded into bespoke shapes and when transparent provides good visibility of products within their packaging	Plastics **endure for centuries** when placed into landfill or littered in the wider environment, creating a negative legacy for future generations
Lightweight – allowing greater numbers to be transported per load and thus reducing transport costs & fuel emissions	Complex laminated films **cannot be mechanically recycled** and chemical recycling is in its infancy
Recyclable – when made of mono-polymers certain plastics have well established recycling infrastructures e.g. PET & PP	Some types of plastic **do not have established and easily accessible recycling infrastructures** e.g. PVC
Durable – resilient in a variety of temperature regimes and physical surroundings	Careful selection of material needed to avoid **crystallisation or shattering** in extremes of temperature
Affordable – relatively low cost compared to other materials	**Specialised sealing equipment** often needed for closure

Paper & Card Materials

- Paper and cardboard packaging is widely used for food packaging due to its versatility and strong on shelf impact
- It is produced from vegetable fibres, sourced from trees, which are pulped and recombined into new structures suitable for food products including paper, paperboard and corrugated cardboard.
- When used as primary packaging, paper may be treated or impregnated with materials such as wax or resins in order to increase protection for the food from external contamination and moisture ingress and certain paper products are now even designed to hold liquids.

Paper and Card Packaging - Advantages & Disadvantages

Advantages	Disadvantages
Strong Visual Impact – can be printed attractively to enhance the marketing of the product inside	**Vulnerable to moisture** and will warp or breakdown if in contact with water unless coated with protective layers
Robust – maintains structure and is capable of surviving impacts when specified to a sufficiently thick micron	Can be **prone to fading** of printed surfaces if exposed to bright/high UV light situations
Protective – thicker and corrugated cardboards can provide strong protection for fragile products when used as primary and secondary packaging	Can **crush or become deformed** if the product inside or primary packaging within a cardboard outer does not fill the pack adequately to support the outer layer
Adaptable & Versatile – paperboard can be moulded into bespoke shapes and innovative cardboard "engineering" can be used to create a range of shapes and sizes	Production processes use considerable water and energy, **raising the carbon footprint** of paper based packaging
Renewable Sources – good forest management practices can be used to ensure ongoing supply and low environmental impacts and can use high levels of recycled content in the manufacturing process	**Opaque** – does not allow product to be visible unless windows are cut into the pack, sometimes needs an acetate/ plastic window to protect contents which reduces recyclability
Recyclable – has well established recycling infrastructures and can be recycled into numerous end uses	**Not infinitely recyclable** as paper fibres break down and become too small to be viable
Hand closure is viable for certain pack formats and outer boxes, thus removing the need for investment in equipment and supporting short production runs	**Prone to tearing** and becoming tatty when on display, downgrading the product value and damaging the image of the brand

Metal Materials

- The following metals are widely used in food packaging
  - Steel
  - Aluminum
  - Tin
  - Chrome
- Metal packaging can be an integral part of the product production process allowing the food to be cooked within the pack and thus sterile. This sterilisation process supports long shelf life.
- Metal packaging has well established recycling infrastructures in many countries and can be infinitely recycled without loss of integrity. Recycled metal has a lower carbon footprint than virgin metal materials.

Metal Packaging - Advantages & Disadvantages

Advantages	Disadvantages
Good barrier – metal packaging protects the product from external contamination, and is a barrier to humidity, moisture and deterioration due to light exposure	Certain metals such as steel may be **prone to corrosion**, thus losing its barrier properties and becoming a contaminant to the food product
Low Toxicity – provides a food safe environment when undamaged	Metal tends to be **relatively expensive** compared to other packaging materials
High temperature resistance – allowing products to be retorted and sterilised within the packaging which results in a long shelf for the food product	**Consumer handling** – products in metal packaging can be heavy to carry & bulky to store at home
Durable – metal packaging is strong and offers good protection to the food or beverage it contains	Requires **investment in multi-stage machinery** to create and fill the metal cans
Recyclable – has well established recycling infrastructures and can be recycled infinitely as it does not degrade	**Opaque** - meaning product is not visible to consumers through the packaging
Adaptable – metal can be moulded to create the optimum shapes and dimensions for the products being packed	Acidic foods can cause **deterioration** in certain metals such as aluminium
Branding Impacts – design & printing options can be used to enhance brand image and ensure strong visual impact	Can become **damaged and dented** during handling
Storage & Transit Friendly – cans stack well and use the cubic space they occupy very cost effectively during transportation and storage	Some formats are **relatively heavy** which restricts the amount of product per outer and per pallet and thus increases transport costs and fuel emissions

Glass Materials

- Glass is an amorphous inorganic product, whose main raw material is silica sand.
- It is generally used in food packaging in the form of bottles and jars
- It has high thermal resistance allowing products to be hot filled to create sterile packs.
- It has excellent vapour, gas and odour barrier properties
- New glass packaging often contains high levels of recycled glass thus improving its environmental footprint

Glass Packaging - Advantages & Disadvantages

Advantages	Disadvantages
Low Migration Risk – from harmful chemicals getting into the food or drinks from the surroundings or on pack printing. No additional barriers or additives are needed when packing	It is a **relatively expensive** packaging material and being **relatively heavy** this drives up transport costs. However, recent technical advances are allowing pack weights to be decreased
Stable - Glass is virtually inert & impermeable, thus a very stable packaging material and is widely used to create sterile foods using hot fill and retort processing methods	Glass is **prone to fracturing** from thermal and physical shocks which represent a risk of harm from cuts to consumers and loss of the product it contains.
Abundant raw materials - Glass is made from sand, soda, ash and limestone materials which are abundant in nature	Breakages during the packing process represent a **contamination hazard** requiring careful management
Product Visibility – transparent glass allows consumers to see the product within the packaging and jars & bottles can be enhanced with printed labels or sleeves.	Product within clear glass containers **may change colour** during their shelf life due to light exposure
Recycling Established– the glass recycling infrastructure is well established in many countries, and it is Europe's most recycled food & beverage packaging material with a collection rate of 78%	Glass requires a **secondary sealing component** in order for products to be packed, sealed & opened for use; this can add cost and care is needed that these materials do not cause migration issues
Infinitely Recycled – as a mono material, glass is 100% recyclable, is recycled endlessly in a closed loop system with no loss in quality or purity & no waste or by-products arise	**Specialised packing lines** are required for filling glass packaging when high production throughputs are desired

Paraffin Wax Materials

- Wax is used as treatment to coat, laminate and impregnate certain primary food contact materials such as paper, board, aluminium.
- Paraffin waxes consists of a solid mixture of saturated hydrocarbons which may be mixed with small PE molecules to modify melting points or have plasticisers and water proofing agents added to enhance their functionality.
- Materials which have been wax coated offer a good humidity barrier to protect dry food from moisture or reduce the loss of humidity from food.
- However, ultraviolet light and heating can lead to packaging degradation requiring antioxidants to be added.
- Therefore, these materials are only suitable for certain selected applications within the food sector but can be useful to wrap sticky products or prevent grease transferring from foods.

More Information :

The following European organisations offer helpful information about specific types of packaging and many countries also have their own trade associations who can provide insight and lists of manufacturers.

For Plastic Packaging : see Plastics Europe

For Flexible Plastic Packaging : see Flexible Packaging Europe

For Metal Packaging : see Metal Packaging Europe

For Glass packaging : see FEVE the European Container Glass Federation

More Information :

The following pan-European websites also provide information about packaging including sustainability issues

European Plastics Pact

Ellen Macarthur Foundation

Packaging Europe

Food Drink Europe

EUROPEN

EPPA – European Paper Packaging Alliance

Food Packaging Forum

CEFLEX

Food Packaging and Climate Change

BIOBASED, BIODEGRADABLE MATERIALS FOR FOOD PACKAGING APPLICATIONS

Innovation

- ✓ Nanotechnology
- ✓ Active materials

Impact

- ✓ Food Quality & Shelf-Life
- ✓ More sustainable Resource Utilisation

Prospects

- ✓ Legislation
- ✓ Market Uptake
- ✓ Litering of waste management

Bio Packaging

The term Bio packaging is used in two ways, either to indicate **packaging made from plant based fibre** sources or to indicate **bio-degradable materials.**
However, care is needed when considering bio packaging as not all bio-based packaging is also bio-degradable and not all bio-degradable packing is plant based !

Bioplastic Packaging - Advantages & Disadvantages

Advantages	Disadvantages
Carbon Footprint – producers claim that bio-plastics have a carbon footprint 4 times lower than fossil fuel based plastics due to lower emissions and use of energy during manufacturing	Concerns exist that land, water and farming **resources are being diverted** from food crops in favour of plastic. **Pesticides and fertilisers** are also often used to enhance crop outputs
Renewable Sources – cellulose is abundant and if harvests are well managed represents a sustainable source of packaging materials	Due to its nature, bio-degradable packaging needs to be segregated from fossil fuel plastics to be recycled but it is **problematic** for consumers to know how & when to do this
Non-toxic - since they contain no chemicals or toxins compared to other types of plastics that can emit harmful chemicals, especially if burned (however if printed heavy metal residues may remain in the environment)	Whilst marketed as compostable, in reality **few countries have industrial scale composting infrastructures** which are easily accessible to consumers, thus in practice bio packaging ends up incinerated or in landfill causing methane
Recyclable – certain biodegradable plastics can also be recycled	As a harvested crop, availability is **dependent on good growing conditions** and favourable weather
Bio-degradable – certain bio-plastics may breakdown in marine and land based environments, reducing the negative effects of littering	Some bio-plastics have a **shorter durability** than oil based equivalents and even if recyclable, it is not feasible to do this infinitely due to **molecules denaturing**
Versatile – bio-packaging can be designed to suit & present the product well and has a positive consumer perception	Often **2 or 3 times more expensive** than fossil fuel based equivalent products and may be less strong in use

Cellulose Materials

- **Cellulose** is an example of a widely used bio-plastic. It is crystalline, infusible and insoluble in water, making it suitable for film formation
- When converted into a flexible film, known as **cellophane**, it is a versatile lightweight packaging medium
- Cellophane can be **transparent or opaque** & can be **printed**
- As cellulose is the most abundant natural polymer on earth, raw materials including wood, cotton and hemp fibres are **widely available to harvest** and be pulped and reformed to make cellulose based packaging
- Cellophane has **high barrier properties** managing oxygen/gas transmission and preventing loss of aroma
- It is **anti-static & has high resistance to grease and moisture**
- It has **good seal integrity for flow wrapping** whilst also offering consumers easy open packs

New Packaging Technologies

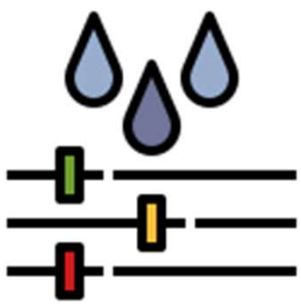
In recent years strides have been made in developing packaging which has functionality beyond the traditional aspects we have considered so far.

Various terms have been adopted for these new packaging technologies and we will now consider these in more detail :

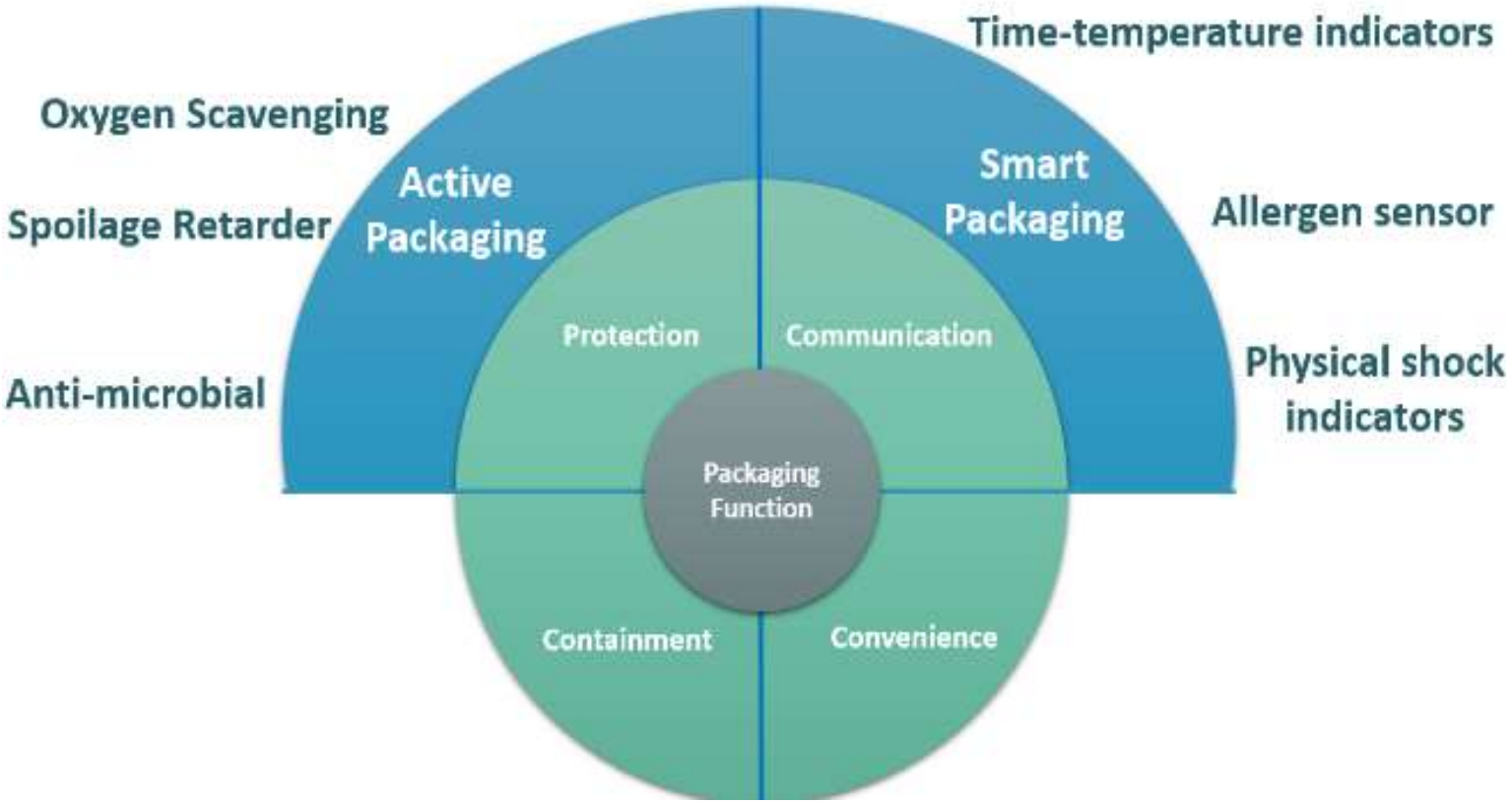
1. **Smart packaging**: Modern packaging that serves a purpose other than protection and containment

2. **Active packaging**: Packaging that actively boosts the product and its potential usage.

3. **Intelligent packaging**: A packaging system that gathers or transmits the data about the product.



Active and Smart Packaging

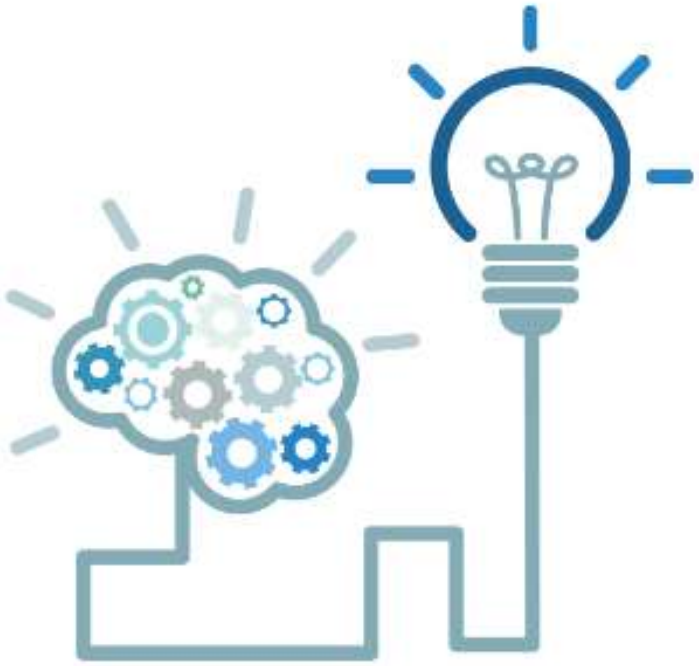


Active and Smart Packaging

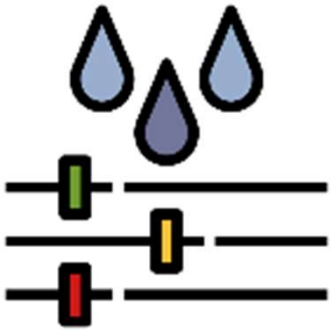
What is Smart Packaging?

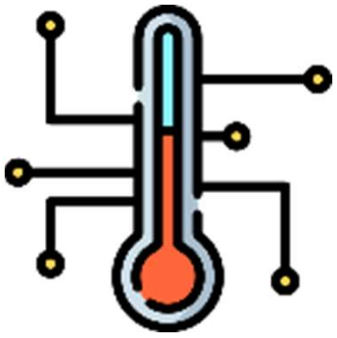
- It is any packaging that provides **specific functionality** beyond the functional physical barrier between the food product and the environment around it

- They are packaging technologies that, through internal and external indicators, **monitor the interaction** between food, packaging and the environment.



Active and Smart Packaging





- **Active Packaging** is designed to **actively enhance** the product and its potential usages.
- For example, active packaging might help the product to deal with moisture control to preserve its integrity and it also helps to extend its shelf life.
- It may monitor the temperatures the product encounters and inform consumers of any abuse during handling which might make the product unsafe to eat.
- It may have anti-microbial properties to help prevent growth of pathogens.

Active Packaging and Its Applications

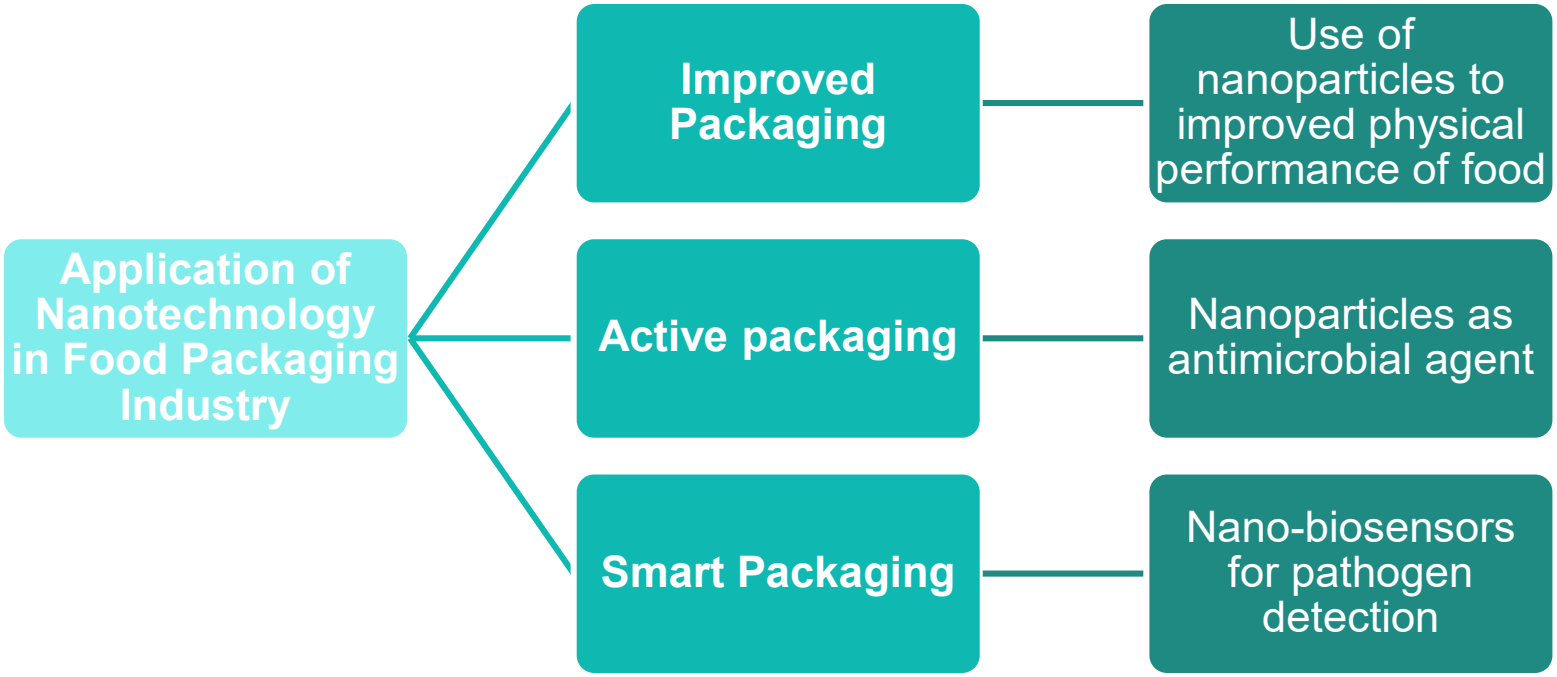
Active Packaging	Principal Components	Applications
Oxygen Scavenging	Iron powders, ascorbic acid, organometallic compounds, glucose oxidase, ethanol oxidase	Bakery products, coffee, tea, powdered milk, cheeses and meat products
Ethylene absorber	Potassium permanganate, activated carbon, silica gel, zeolite, clay.	Fruits and vegetables
Humidity absorber	Propylene glycol, silica gel, diatomaceous earth, clay	Fruits, vegetables, frozen and baked goods
Carbon dioxide absorber	Calcium hydroxide + sodium hydroxide or potassium hydroxide, calcium oxide and silica gel	Roasted coffee, dehydrated products
Ethanol emitters	Ethanol	Bakery products, fish
Antimicrobial release and preservatives	Sorbate, benzoate, ethanol, peroxide, sulphur dioxide, silver zeolite, enzymes	Meat, fish, cheese, nuts and baked goods
Carbon dioxide emitters	ascorbic acid, iron carbonate + metal halide	Fruits and vegetables, fish, meat and poultry

Smart Packaging and Its Applications

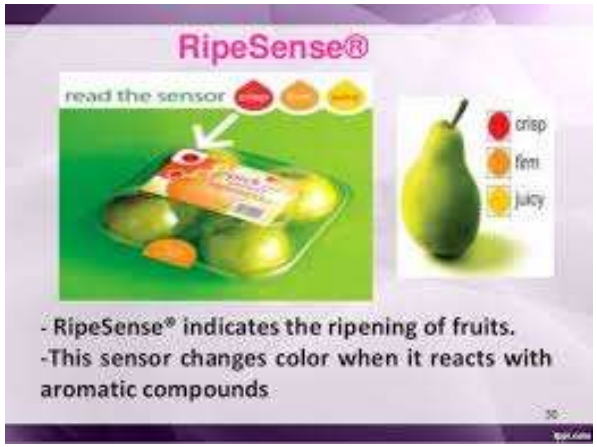
Smart Packaging	Principal Components	Applications
Microorganism growth indicators	pH dyes, all types of dyes react with metabolites (volatile and non-volatile)	Perishable foods (fish, poultry)
Oxygen indicators	Redox inks, enzymatic, pH dyes	Food stored in low oxygen concentrations
Carbon dioxide indicators	Chemicals	Food packaging with modified or controlled atmospheres
Time-temperature indicators	Mechanical, chemical and enzymatic	Frozen and chilled foods
Pathogenic indicators	Various chemical and immunochemical methods react with toxin	Perishable foods such as meat, fish and poultry

Nanotechnology Packaging

Nanotechnology has significantly increased its impact on the food and beverage packaging industry and is predicted to continue to transform food packaging materials in the future.



Active and Smart Packaging Examples



Active and Smart Packaging Examples

sofresh™ We Positively Save Food™

SoFresh Inc.™ has developed a breakthrough technology solution that wraps food in an atmosphere of food grade vapor inhibiting mold growth that extends food travel life, shelf life and consumption time.

SoFresh discovered methods to infuse food grade natural extracts into film or containers that emit controlled active vapor inside a food package. The mold spores absorb the vapor which slows down their metabolism to the point where it is difficult for them to thrive.

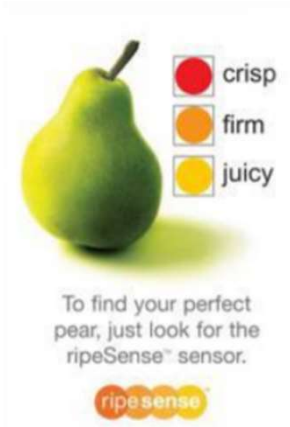
Active and Smart Packaging Examples

Ripeness Sensors

- SenseLabel – senses aromatics emitted from ripening fruit

- Signals ripeness by label visual cue/col or change – for fruit that does not change color during ripening:

  - Pears
  - Melons
  - Avocados



Active and Smart Packaging Examples

OCEAN WARE®

AN OCEANIUM® BRAND

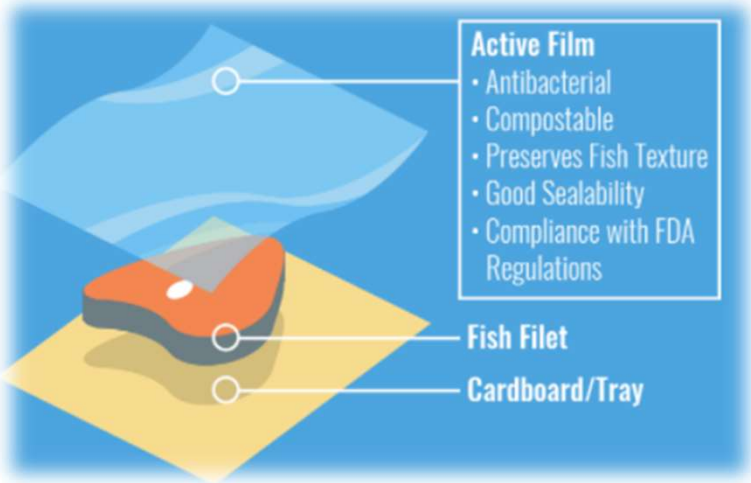
Oceanium is in the processing of developing all-natural, sustainable bio-based materials to replace carbon-intensive and resource-intensive products that have limited end-of-life solutions

The first iterations of our products will be designed to be disposed of with food waste which will then be composted for soil health or for anaerobic digestion to generate energy. A fully circular life cycle.

Active and Smart Packaging Examples

IHRD
Impactful Health Research & Development
Impact Santé Recherche Et Développement

Impactful Health R&D develops sustainable active packaging to prolong the shelf life of fresh foods, starting with fresh fish.



Legislation Regulating Food Packaging Materials

General Regulations on Food Contact Materials

For Countries within the European Union, and Northern Ireland, the **EU Commission Regulation (EC) No. 1935/2004** establishes the general principles of safety and inertia for all food contact materials

Principles established in the regulation require that the materials do not:

- Release their constituents to food at levels harmful to human health
- Change the composition, taste and odour of food unacceptably

The regulation also provides:

- Special rules on active and smart materials
- Powers to adopt additional EU measures for specific materials (e.g. plastics). When a specific measure is adopted, business operators must provide written Declaration of Compliance
- Business operators must establish a traceability system for FCMs from production to distribution;
- Labelling: Materials and articles, which are not yet in contact with food when they are placed on the market shall be labelled with the words 'for food contact', or a specific indication as to their use or the symbol: 

General Regulations on Food Contact Materials

Businesses in Great Britain – including those in Wales, England and Scotland need to comply with the retained EU regulations as amended Post Brexit.
As mentioned previously, EU rules apply in Northern Ireland.

The UK Government provides details and further links about General Food Law on their website here

Guidance on gaining authorisation for food contact materials in Great Britain is available here

The Welsh Government explain what elements of Food Law are devolved in Wales here

General Regulations on Food Contact materials

Commission Regulation (EC) No. 2023/2006 ensures that the manufacturing process is well controlled so that the specifications for FCMs remain in conformity with the legislation.

Principles established:

- Premises fit for purpose and staff awareness of critical production stages
- Documented quality assurance and quality control systems maintained at the premises
- Selection of suitable starting materials for the manufacturing process with a view to the safety and inertness of the final articles

General Regulations on Food Contact Materials - DOC

The **DOC** or **Declaration of Compliance** is a self-issued document stating certain information about a food contact material or food contact products.

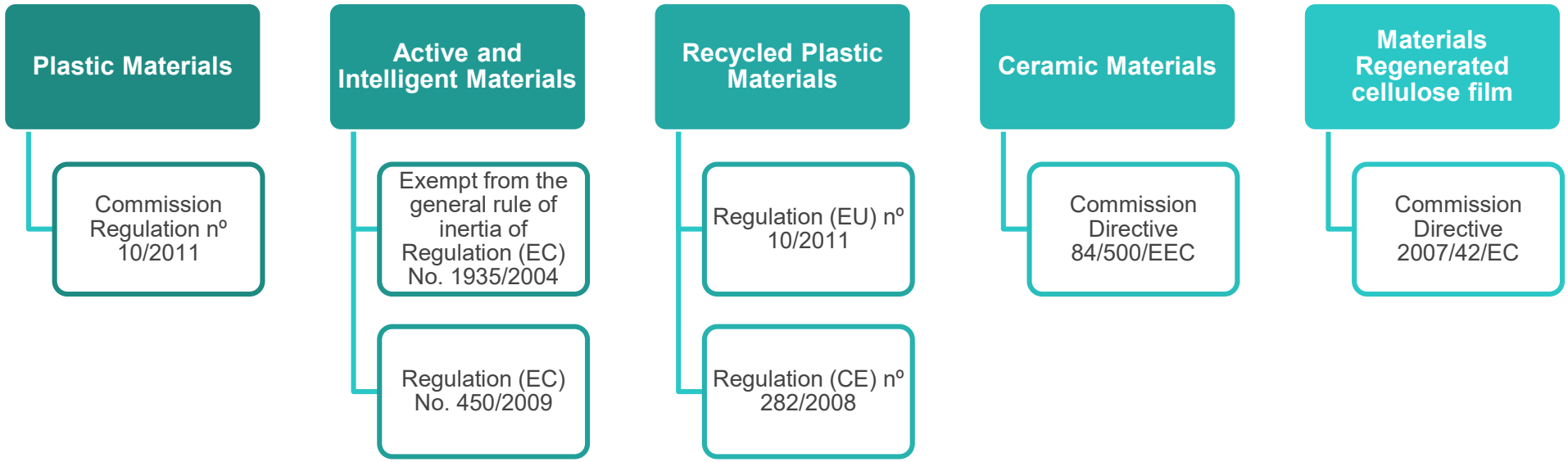
The information generally included is:

- Importer/Manufacturer
- Product name
- List of materials/components
- Statement declaring that the product is compliant with certain regulations
- Information about the substances
- Types of food the material is made for contact with
- Time and temperature parameters
- Information about the test methods used

EU Legislation on Specific Materials

In addition to the general legislation, certain FMCs (Food Contact Materials) including **ceramic materials, regenerated cellulose film, plastics (including recycled plastic), as well as active and intelligent materials** — are covered by specific EU measures.

There are also specific rules on some starting substances from which FCMs are manufactured.



EU legislation on Specific Materials - Plastic Materials

EU 10/2011 sets out specific requirements for the manufacture and marketing within the European Union of plastic materials and articles:

(i) intended to come into contact with food;
(ii) already in contact with food;
(iii) which can reasonably be expected to come into contact with food.

The Annex lays down the European Union list of authorised monomers, other starting substances, macromolecules obtained from microbial fermentation, additives and polymer production aids.

An important mechanism to ensure the safety of plastic materials is the use of migration limits.
These limits specify the maximum amount of substances allowed to migrate to food.
For the substances on the European Union list the Regulation sets out 'Specific Migration Limits' (SML):

- To ensure the overall quality of the plastic, the overall migration to a food of all substances together may not exceed the Overall Migration Limit (OML) of 60mg/kg food, or 10 mg/dm2 of the contact material.

EU legislation on Specific Materials - Active and Intelligent Materials

Active and Intelligent Materials are exempted from the general inertness rule in Regulation (EC) No 1935/2004.
The specific rules in **Commission Regulation (EC) No 450/2009** apply to address their specific purpose, e.g.:

- Absorption of substances from food packaging interior such as liquid and oxygen
- Release of substances into the food such as preservatives
- Indicate expiry of food through labelling that changes colour when maximum shelf life or storage temperature is exceeded

Commission Regulation (EC) No 450/2009 foresees the establishment of a Union list of substances permitted for the manufacture of active and intelligent materials.

EU legislation on Specific Materials – Recycled Plastic Materials

Commission Regulation (EU) No 10/2011 sets out criteria for the composition of new plastic materials.

However after these materials have been used, they do not comply anymore to the plastic Regulation, as they may have been contaminated with other substances.

Therefore, a separate Regulation exists to control the recycling processes: **Commission Regulation (EC) No 282/2008 on recycled plastic materials and articles intended to come into contact with foods**.

Valid applications for authorisation of recycling processes: to produce recycled plastic materials and articles intended to come into contact with foods.

EU legislation on Specific Materials – Ceramics and Regenerated Cellulose Film

Ceramics have not been individually regulated but in **Directive 84/500/EC migration limits** have been set for **cadmium and lead, heavy metals** known to migrate commonly at low levels.

Regenerated cellulose film is regulated under **regulation** Directive 2007/42/EC, which contains a positive list of substances that can be used for its manufacturing.

Furthermore, printed surfaces may not come into contact with food stuffs.

Cellulose films intended to come into contact with food have to be accompanied by a written declaration at marketing stages other than the point of retail sale.

Other EU Legislation

Legislation on Specific Substances:

•Commission Regulation (EU) 2018/213: on the use of bisphenol A in varnishes and coatings intended to come into contact with food and amending Regulation (EU) No 10/2011 as regards the use of that substance in plastic food contact materials.

•Commission Regulation 1895/2005/EC: restricting use of certain epoxy derivatives in materials and articles intended to come into contact with food. In Regulation EC 1895/2005, BADGE and its hydrolysis product's migration is limited to 9mg/kg of food and that of BADGE chlorohydrins to 1 mg/kg of food. BFDGE and NOGE have been completely banned from food contact materials.

•Commission Directive 93/11/EEC: release of N-nitrosamines and N-nitrosatable substances from rubber teats and soothers.

We hope that you have found this training module a useful and helpful support to your healthy food and drink innovation.

This training module is one of a number of training opportunities, organised into themed training programmes to support SME's (small & medium sized enterprises) in the participating regions of Wales, Northern Ireland, Ireland, Spain, Portugal and France to successfully bring new and reformulated healthy food and drink products to market.

The training was created by the partners within the AHFES project
which is a quadruple helix Atlantic area healthy food eco-system for the growth of SME's
funded by the European Union under the Interreg Atlantic Area Funding Programme.

This programme promotes transnational cooperation among 36 Atlantic regions of 5 European countries and co-finances cooperation projects in the fields of Innovation & Competitiveness, Resource Efficiency, Territorial Risks Management, Biodiversity and Natural & Cultural Assets.

For more information about other training available please click here.

This project is co-financed by the European Regional Development Fund through the Interreg Atlantic Area Programme

Acknowledgements

This is where you give credit to the ones who are part of this project.

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