N Sutton May 2008

Design Technology

International Baccalaureate Organisation (IBO)

Food Option
A7 Food Packaging & Distribution

Name: TG: Date:

A7 Food Packaging & Distribution (3 hours approx 3 lessons)

Explain why food is packaged

To be effective, packaging must perform the following functions:

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It also provides convenience.

Packaging protects food products from physical damage during transportation and storage so that the product reaches the customer in perfect condition. It protects it from deterioration due to high or low humidity, the effects of temperature changes, insect attack, mould growth, oxidation and moisture loss. It guarantees food safety and hygiene.

Packaging contains the contents so that they can be transported, stored and displayed easily. It helps more awkwardly shaped products easy to handle.

Packaging can be part of the process of preservation, for example tin cans and modified atmosphere packaging.

Packaging identifies the contents and informs the consumer. A description and all the labelling information can be printed on the packaging. This helps the consumer choose exactly what they want.

Packaging helps stop the tampering of goods. People opening the packaging, tampering with the contents, then reclosing the package sometimes contaminate products.

Packaging offers the consumer convenience, e.g. microwaveable containers, drinks that can be resealed.

Types of Packaging - write a definition for each below (pg 206 FTIA)

- *Primary packaging*

- *Secondary packaging*

Food Packaging Materials


A variety of materials are used for food packaging. Many types of food packaging use two or more materials in the construction of the package. Described below are some of the most common materials used in food packaging.

- Metals: a wide range of metal alloys are used for cans and containers, lightweight foils, and food pouches.
- Plastics: many formulations of plastic are used for rigid and flexible containers, food pouches, resealable food bags, and nonporous films that conform to specific food shapes.
- Glass: used most commonly for jars and bottles and usually in conjunction with metal for construction of the screw on lids.
- Paper: used for lightweight cartons, containers, and bags. It is also used in conjunction with other materials, such as metal foils and plastics. For example, it is often used as a colorful outer covering for foil wrapped chewing gum and candies.
- Cellophane: used for food wraps and wrapping individual items within a carton. It is also used in conjunction with paperboard boxes as a see through window revealing the product inside the box, as in the case of some pasta products.

Complete the chart below filling in the gaps

Packaging material	**Reasons for use**	**Foods packaged using the material**
PLASTICS PVC		Non carbonated drinks, vegetable oils
High Density Polythene		Milk and fruit juice
Low Density Polythene	Polythene bags and films	Cook-chill meals, frozen meals
PET	Bottles for carbonated drinks and cooking oils	Carbonated drinks and cooking oils
CPET	Containers and ready meals	Ready meals
Polystyrene		Yoghurt, meat
Polypropylene		Biscuits, snacks, sweets
PAPER Cardboard	Can be recycled coloured and printed successfully, can be made into a variety of shapes by cutting, creasing, folding and gluing.	
Paper	Can be recycled coloured and printed successfully, can be made into a variety of shapes by cutting, creasing, folding and gluing.	
GLASS Glass	Can be recycled. Strong. Prevents loss or gain of moisture and oxygen or other gases. Coloured, transparent. Can be printed. Can be made into a variety of shapes or sizes. Does not react with food	
METAL Aluminium	Strong, withstand heat processing, withstand internal pressure, impermeable, lightweight	

Do packaging materials affect the food in them or the people who consume the packaged foods?

The main area for concern is the quality of the food, however it is also worth noting the research that is being conducted regarding the toxicity of plastics that are used for packaging or containing food.

1. What affect does the material have on the organoleptic properties/quality of the food.

a) Investigate the use of metal cans, glass, paper/card, foils and plastics, and describe how different packaging materials affect food. Pg 201-206 in the text Food Technology in Action—Look specifically at page 202 table 11.2 .

b) Explain how certain foods can have an affect on the corrosiveness of cans.

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2. Are all packaging materials used safe?

The packaging material for a particular food must be carefully selected with safety considerations in mind. Most countries have developed strict controls, based on extensive testing, for the use of "food contact" materials; and these help to ensure that a correct choice is made. However recent publicity has created concern about the toxins that may be released into the food/drink we consume.

a) Research the use of plastics for food packaging and the concerns with chemicals being released into foods, particularly once heated. (Present this information as a summary of your findings on A4 paper.)

Some useful references:

Food Science Australia Fact Sheet
Migration from plastic packaging materials
http://www.foodscience.csiro.au/migpac.htm

There has been a lot of publicity recently about BPA (bisphenol A) in babies bottles & cups, but this is also found in canned food products.

BPA in canned foods: Tips to avoid it
http://safemama.com/2008/05/03/bpa-in-canned-food-tips-to-avoid-it/
http://www.ewg.org/reports/bisphenola

PVC
http://www.checnet.org/HEALTHEHOUSE/education/articles-detail.asp?Main_ID=185

Packaging & Labelling

What is the purpose of a food label?

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What information must be provided?

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How does legislation govern what should appear on food labels?

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Is this effective in encouraging consumers to alter their diets? Explain your answer.

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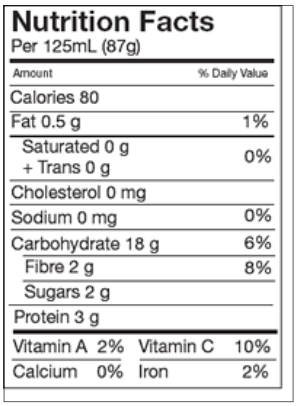
Read the following articles to help answer the above questions.

Hong Kong food label law to be toughened
http://www.tickets-beijing2008.com/chinaolympics/910.html

Food Label Law
http://lesleycroftblog.typepad.com/expat_lady/2008/05/food-label-law.html

It's your health - Nutrition Labeling
http://www.hc-sc.gc.ca/iyh-vsv/life-vie/labelling-etiquetage_e.html

Allergy sufferers upbeat over adoption of food-labeling law
http://hongkong.hktdc.com/content.aspx?



Nutrition Facts
Per 125mL (87g)

Amount	% Daily Value
Calories 80	
Fat 0.5 g	1%
Saturated 0 g + Trans 0 g	0%
Cholesterol 0 mg	
Sodium 0 mg	0%
Carbohydrate 18 g	6%
Fibre 2 g	8%
Sugars 2 g	
Protein 3 g	
Vitamin A 2%	Vitamin C 10%
Calcium 0%	Iron 2%

data=International_content_en&contentid=166065&src=IN_LawReg&w_sid=194&w_pid=665&w_nid=10242&w_cid=166065&w_idt=1900-01-01&w_oid=166&w_jid=

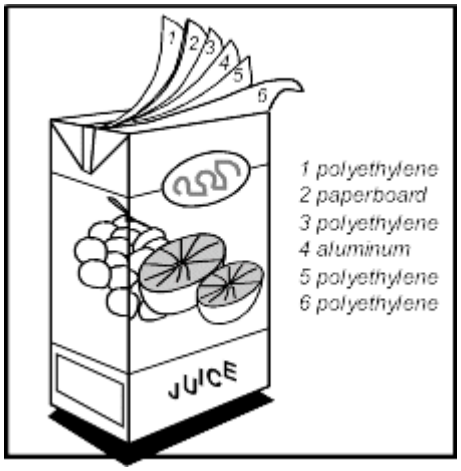
Food Labeling Requirements in Hong Kong
http://www.legco.gov.hk/yr99-00/english/panels/ti/papers/a1604e03.pdf

Current Developments

Plastic bags are a convenient, space saving method for packaging and storing food and increase the shelf life of many foods. Certain foods, such as salad greens, deteriorate in quality quite rapidly, but the food and packaging industries have found better ways to use plastic bags to maintain the freshness of such items for days beyond the usual shelf life. A technology known as MAP (Modified Atmosphere Packaging), allows the atmospheric conditions within the plastic bag to be controlled, thereby slowing the rate of deterioration.

1. MAP (Modified Atmosphere Packaging)
Modified atmosphere packaging is used to prolong the shelflife of all sorts of fresh foods. It modifies the composition of the internal atmosphere of a package by aiming to lower the amount of oxygen. The removed oxygen can be replaced with nitrogen or carbon dioxide which can lower the pH or inhibit the growth of bacteria.

Aseptic packaging



2. Aseptic packaging
- Explain what aseptic packaging is and list at least FIVE food products it is used for.

http://www.aseptic.org/

List FIVE features manufacturers have added to packaging in recent years.

Food Packaging - is it just a package?

Identify what each of the following food products aims to achieve through the packaging.

Figure 1

Figure 2

Figure 3

Figure 4

Waste facts

- In 2001 UK households produced the equivalent weight of 245 jumbo jets per week in packaging waste.
- Every year UK households throw away the equivalent of 3 ½ million double-decker buses (almost 30 million tonnes), a queue of which would stretch from London to Sydney (Australia) and back.
- 11% of household waste in the UK is plastic, 40% of which comes from the 15million plastic bottles used every day. Only less than 3% of these plastic bottles gets recycled.

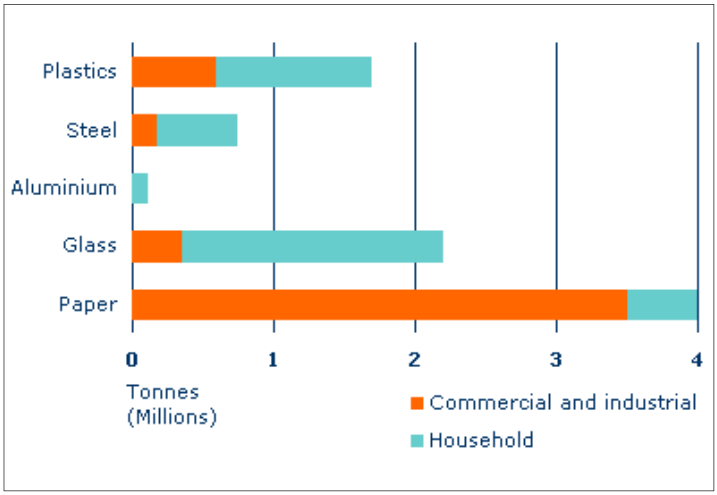


Figure 1 Packaging Waste entering the Commercial/ Industrial and Household Waste Streams
SOURCE: INFORMATION FROM DETR 1999B

Figure 2: Picture that shows the amount of rubbish created from packaging

Consider the impact alternative packaging decisions have on product cost and the environment.

Non-biodegradable packaging and non– recyclable raw material uses large amounts of energy in production. These items are used once and thrown away, creating havoc for the environment. By altering any of these elements the outcome can be far less destructive for the environment.

- List strategies **manufacturers** could adopt to reduce the cost of production and reduce the environmental impact.
- List strategies **consumers** could adopt to reduce the environmental impact.

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Recycling Pros and Cons
http://www.passaiccountynj.org/Departments/naturalresources/recproco.htm
The effect of packaging on today's society and how it can be reduced
http://www.annesley.sa.edu.au/amep/solidwaste/chazessay.htm
Environmentally friendly food packaging
http://www.greentechnolog.com/2007/08/environmentally_friendly_food_packaging.html

Explain how packaging of food products contributes to the development of brands.

- How has coke used packaging to become a leading brand of cola?

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- How did the packaging of Pringles assist with the establishment of the brand?

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Discuss the global impact of branded products, for example Coca-Cola.

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	Assessment statement	Obj	Teacher's notes
A.7.1	Identify the functions of food packaging.	2	Distinguish between primary packaging and secondary packaging.
A.7.2	Identify a range of materials used for food packaging.	2	Consider paper, plastic, glass and metal.
A.7.3	Describe how different packaging materials affect food.	2	
A.7.4	Explain the impact of alternative packaging decisions on product cost and the environment.	3	Packaging solutions that use non-biodegradable and non-recyclable raw material, use much energy in their production and are used once and thrown away wreak havoc on the environment. Altering any of these elements can minimize environmental impact.
A.7.5	Identify current developments in packaging.	2	Consider modified atmosphere packaging and aseptic packaging.
A.7.6	Outline how food packaging is used as a promotional tool for other products.	2	
A.7.7	Explain how packaging of food products contributes to the development of brands.	3	
A.7.8	Discuss the global impact of branded products, for example, Coca-Cola®.	3	
A.7.9	Describe the purpose of food labels and the information provided on them.	2	Include nutritional content, sell-by date, storage and usage information, ingredients, warnings, volume or mass. Exclude promotional details. Only a qualitative treatment is required. The provenance of food products is increasingly important, and food labels increasingly contain the name of the farm or farmer where they were sourced.
A.7.10	Discuss the impact and effectiveness of legislation governing what should appear on food labels as a means of altering diet.	3	Diets are resistant to change due to cultural issues and habit. Food labels can provide information on sugar content, fibre content, fat content, and so on. But unless individuals choose to change, labels are unlikely to have much impact. Government initiatives may focus on fat, fibre, sugar or salt intakes to counter heart disease.