GENERAL COMMENTS

The 2001 examination was designed to assess the student's knowledge and understanding of Unit 3, Areas of study 1 and 2 and Unit 4 and Areas of study 1 and 2. The four examination criteria, (published in Supplement 2 to the December 2000 *VCE Bulletin*) were drawn from the four Areas of study. The paper consisted of ten short-answer questions, which were based on the examination criteria.

Areas of strength and weakness

Strengths included:

- explaining packaging techniques
- explaining types of product development
- demonstrating understanding of concepts related to genetically modified foods
- explaining the role of natural food components
- demonstrating awareness of environmental issues in food production
- explaining the cook-chill process
- demonstrating understanding of promotion and advertising strategies
- demonstrating knowledge of processing techniques to prevent deterioration of foods
- demonstrating understanding of labelling requirements of food
- explaining the role of Australia New Zealand Food Authority (ANZFA) and food safety
- using practical examples and their own experiences to illustrate answers.

Weaknesses included:

- explaining factors involved in product development
- explaining the properties of modified food products
- explaining why specific tools and equipment are used with modified foods
- stating criteria for evaluation of new food products (line extensions)
- explaining the purpose of primary food processing and consumer benefits of secondary food processing
- comparing batch with continuous food production systems
- explaining the hazard analysis critical control point (HACCP) system
- providing irrelevant answers or those not directly related to the questions asked.

SPECIFIC INFORMATION

Question 1 (Average mark 2.58/Available marks 6)

Students were required to provide a detailed reason as to why a food product (or idea) may be eliminated at each of the stages listed in the question. One mark was awarded for a brief answer and 2 marks for a more detailed response. Most students showed an understanding of the product development stages but had difficulty explaining why a food product might be eliminated at each stage.

Suitable answers could have included the following:

i. design brief stage

There may already be a similar product in the market place, which would limit the possible market value of a proposed new product. The proposed product may be too expensive to produce, and so not be economically viable. Raw materials may not be available or may be too expensive to use. Equipment and machinery to make the product may be unavailable or too expensive.

ii. prototype stage

The prototype may not meet the requirements of the design brief. The current equipment available may not be suitable, and purchasing new equipment may not be a cost effective option. The properties of the food may not be suitable for the proposed product or there may be too much wastage.

iii. retail sale

Sales may not be high enough. This could be because consumers have 'brand loyalty' to another brand, the new product is too expensive or a competitor may produce a 'me-too' product that takes over the market.

Question 2

a. (1.73/3)

Students needed to give a reasonable explanation of how each of the factors could have affected the packaging design. Environmental concerns were addressed well but properties and storage/distribution considerations were poorly answered.

Suitable answers could have included the following:

i. environmental concerns

Consumer demand for reduction in packaging and environmentally friendly products is important when considering packaging design. Whether the packaging is degradable, can be re-used, or re-cycled and how it can be disposed of are all important considerations.

ii. properties of the soup

As the soup is liquid, the sturdiness of the packaging needs to be considered. For example, the package needs to have a sturdy base so that it can stand up on the shelf. The packaging needs to be strong enough so that the plastic cannot be easily pierced. The package needs to be constructed so that it is leak proof.

iii. method of distribution and storage

As the plastic pouches are soft and flexible, consideration would need to be given as to whether or not they should stand up, whether they need to be packed in trays and how much space it would take to store them. The weight of the package could be important when lifting and transporting the food.

Parts b and c were answered well with most students demonstrating a clear understanding of types of product development. One mark was given for identifying the term and 2 marks for the explanation as to why this soup was developed. To gain 2 marks in the second part of the question students needed to include two points, or give a detailed explanation of one point.

b. (1.32/3)

Suitable answers could have included the following:

i.

'Me-too' product

ii.

A 'Me-too' product is a direct copy of an existing product that is developed in response to a successful product from a rival company being produced in order to gain a share of the market. The Amazing Soup Company has also developed this direct copy of the product produced by The Super Soup Company because it will allow them to enter an established market.

c. (1.66/3)

Suitable answers could have included the following:

i.

Line extension

ii.

In order to re-position a product in the market or rejuvenate it in the eye of the customer, a manufacturer may develop line extensions. The Super Soup Company developed a low-salt variation (line extension) of the product to increase their volume of sales, and ultimately their market share.

Question 3

a. (3.21/8)

Students needed to provide a detailed explanation as to how each of the factors could have increased the number of food products on the Niceway supermarket shelves. This was a challenging question. Social pressures and consumer demand were answered well; however, technology changes and industry economics were not.

Suitable answers could have included the following: (2 marks each)

i. social pressures

An increase in the number of working mothers has contributed to the number of food products on our shelves, which save time and energy for the consumer, for example bottled pasta sauces. Increased working hours for many means less time to think about meal preparation and less time to prepare and cook meals. This has led to an increase in the number of home meal replacements available, such as the Lean Cuisine range.

ii. technology changes

Technology changes such as the introduction of microwaves into homes has led to an increase in the number of products, which can be cooked/heated in the microwave. Changes to processing and packaging in recent years have also impacted on the number of products available. Milk can now be purchased in a variety of forms and in a variety of packaging types such as plastic bottle and cartons.

iii. consumer demand

Changing demographics and the range of ethnic groups in Australia has led to an increase in the number of products that reflect the food patterns of other cultures. For example, this has led to an increase in Asian products such as types of rice available, bottled sauces and pastes. Greater awareness of and differing nutritional needs have also led an to increase in products on supermarket shelves. For example, there has been an increase in the number of vegetarian products and lactose-free foods.

iv. industry economics

The import/export market can also influence an increase in new products. Easy accessibility to products from all over the world means that consumers now have an increased range of products available to them.

b. (1.03/2)
Two points needed to be made describing a recently developed packaging technique. Most students answered well, although some did not describe a **recently** developed packaging technique (e.g. pull top cans are not considered recent) and so were not awarded any marks even if the description was correct.

Suitable answers could have included the following:

- aseptic packaging involves the separate sterilisation of food and packaging at extremely high temperatures
- the treatment of both the packaging and food at high temperatures, ensures that all microorganisms are destroyed and spoilage of the food is prevented
- foods using aseptic packaging do not require refrigeration until opened, e.g. UHT milk.

c. (0.39/1)
A suitable definition of a modified food product was required but was not very well answered by students.

A suitable answer could have been:
A modified food product is created when the physical and/or chemical properties of a traditional or existing food are changed.

The following definition for modified foods is found in the *VCE Assessment Guide Revised VCE 2001 Technology* (page 23).

> Modified food products are those food products where the physical and/or chemical properties of a traditional or existing food are changed. The change occurs as a result of modification due to the use of technology prior to production, e.g. New Start Eggs, or during production, e.g. low fat milk. Modified food products include foods with an overall lower fat content (e.g. low fat milk), salt reduced foods, gluten free foods, lactose free foods, artificial sweetener, pre-cooked rice, and UHT milk.

d. (2.09/4)
No marks were awarded for naming the existing or modified product. One mark was awarded for the explanation of each of the properties selected from the list provided. Many students answered poorly due to their choice of a modified product.

Suitable answers could have included the following:
Existing product – full cream milk
Modified product – low fat milk, e.g. Physical

Selected property	**Explanation**
Appearance	Physical looks more watery and may have a slight blue tinge. The full cream milk appears more yellowy and creamy looking.
Nutrient content	During processing, Physical has had some of the fat content removed. Physical is also considered to be an enriched product because calcium has been added.
Flavour	Physical tastes more watery and not as creamy as full cream milk.
Mouth feel	Full cream milk has a thicker mouth feel than Physical, which has a more watery, thinner mouth feel. Full cream milk has a 'furrier' feel and can leave a coating on your teeth/tongue.

e. (0.14/2)
A suitable explanation about specific tools/equipment or methods of preparation to be selected when using modified food products was required. This was very poorly answered with few students attempting this question.

A suitable answer was:
When using Ready Whites, it would be preferable to use a whisk or electric beater. This allows for the egg whites to be aerated and increase in volume. Using a fork would not be an efficient use of time or energy, nor would it allow for adequate aeration.

Question 4 (2.43/6)
Students needed to discuss advantages and disadvantages of genetically modified (GM) foods for both producers and consumers, and provide examples of GM foods. Most students made a reasonable attempt at this question but many did not address all aspects of the question.
Suitable answers could have included the following:

- Advantages for food producers include the fact that yields may be increased when GM foods are grown. Crops that are resistant to pests do not require the use of particular types of pesticides. Crops can be developed that are suited to local growing conditions, and so will grow better. Food producers can make more money from their crops.

- Disadvantages for food producers include the increased cost of purchasing seeds due to research and development costs of the seed producer. Growers may need to change their growing methods. Consumers may not want to buy the products that have been genetically modified and so growers may lose sales.
- Advantages for consumers include products that have better appearance, texture and shape. The food may have better nutritional content and could have a longer shelf life.
- Disadvantages for consumers include the risk of unknown origin of genes for people with food allergies and the consumer's fear of an unknown food source. The GM food may be more expensive than other options available.
- Examples of food products include Flavr Savr tomatoes that have decreased water content and better flavour and keeping qualities, and soy beans which are resistant to the herbicide Roundup.

Question 5

a. (2.31/6)

Although generally answered well many students were unable to give two reasons as to the role of the stated food component.

Suitable answers could have included the following:

- Fat or oil coats the starch and separates the gluten in the biscuit and so provides shortening to the biscuit. It provides the biscuit texture, crispness, and tenderness and adds flavour. Fat or oil gives the biscuit a smooth mouth feel.
- Starch provides the structure of the biscuit and allows the biscuit to brown.
- Sugar also allows the biscuit to brown, through the Maillard reaction. It makes the biscuit tender and adds sweetness to the biscuit. Sugar also allows for moisture retention in the biscuit.

b.

One mark was given for a description of a possible line extension for the biscuit. Two marks were given for naming the target market and explaining why it would appeal to this group, and 3 marks for an explanation of criteria for assessing the suitability of this line-extension. Most students were able to state a possible line extension for the biscuit and identify a target market for this biscuit; however, many students did not provide suitable criteria to determine the acceptability of this line extension to the consumer.

Examples of acceptable responses included:

bi. (0.84/1)

The biscuit could have cocoa added to make a chocolate flavoured biscuit. The biscuit could be made with reduced fat or sugar content or the filling could have almond flavouring added.

bii. (1.34/2)

The new biscuits would have a similar target group to the original biscuits such as people who want an up-market treat to have with a cup of coffee. The reduced fat or reduced sugar biscuits would be suitable for people who are conscious of the amount or type of fat or sugar in their diet, e.g. weight watchers or those reducing the cholesterol in their diets.

biii. (1.02/3)

Is the flavour appealing to the consumer?
Is the texture suitable for a biscuit?
Is the appearance appealing to the consumer?
Is the colour rich and golden?

Question 6

a. (0.42/1)

Providing a clear purpose for primary processing was required but was poorly answered.

A suitable answer was:

Foods undergo primary processing to prepare them for human consumption after harvest or slaughter. They can be consumed after primary processing, or used in further processing either by a manufacturer or the consumer.

b. (1.7/4)

There were 2 marks for providing the benefits of secondary processing for the manufacturer and 2 marks for providing benefits of secondary processing for the consumer. This was poorly answered with students unable to give the benefits to the consumer or manufacturer.

Suitable answers could have included the following:

- Through secondary processing the manufacturer has a wider range of products available for sale, and so is able to make a greater profit. They are able to gain a larger share of the market because of the availability of this wider range of products.
- Foods undergo secondary processing to provide a wider variety of foods for consumers. Food preparation time may be decreased, the food may become more attractive, or the food may become more appealing to the consumer.

c. (1.02/3)
Students were required to identify a food commodity that undergoes secondary processing and provide at least three key processing steps. In part c, students demonstrated some understanding of the key steps involved in secondary processing of a food commodity.

A suitable answer could have included the following:
The processing of milk into cheese:

- the milk is coagulated by adding either lactic acid or rennet
- the curds are separated from the whey
- the curd is treated according to the type of cheese being made
- the cheese is shaped and left to ripen.

d. (1.63/4)
Students were required to discuss two environmental issues that may arise during food production. This was handled well by most students demonstrating an understanding of the environmental concerns that can occur during food processing.

Suitable answers could have included the following: (2 marks each)

- During grain cultivation producers need to avoid the overuse of chemicals and pesticides as these have a negative affect on the environment.
- Producers also need to ensure that through the clearing of land they are not causing degradation of the soil.

Question 7

a. (1.18/2)
A detailed description of the cook-chill process was required. Most students demonstrated some understanding of the cook-chill process but many could not fully explain the process.

A suitable answer was:
Food is partially or fully cooked and then quickly packaged and chilled rapidly, but not frozen.

b. (1.16/2)
There was 1 mark for each advantage of the cook-chill process for the target group. Many students did not describe advantages to the target group.

Suitable answers could have included the following:

- The cook-chill pizza may be of a better quality than a frozen pizza in terms of colour, texture, flavour, and nutritional content.
- The cook-chill pizza does not need to be thawed before cooking and so time is saved.

c. (1.21/2)
There was 1 mark for identifying the packaging technique and one for justifying its selection. This was handled well with most students able to provide a suitable packaging technique and explanation of its benefits.

A suitable answer was:
I would use a round cardboard base with plastic shrink-wrap over the top, so that the consumer can see the pizza, and it is able to be stored in the fridge without it drying out or falling apart.

d. (2.23/4)
There was 1 mark for each strategy and one for each accompanying explanation. This gave the students the opportunity to provide interesting and varied answers to advertising and promotional strategies.

Suitable answers could have included the following:
Strategy 1: The manufacturer could employ someone to hand out samples outside a nightclub where young people are going so that they become aware of the new pizza, and can become aware of its quality, flavour etc.
Strategy 2: Advertising in the cinema at a film young people are attending or on TV during a show that has a young adult audience, to increase the target groups awareness of the existence of the new product.

Question 8

a. (2.66/6)
One mark was given for the explanation of each technique and 1 mark for the example of the food product resulting for each technique. Many students did not select from the provided list of processing techniques and so were unable to be awarded marks. Many did not provide examples related to the processes. For example, if writing about dehydration, a suitable example would have been semi-dried tomatoes. The response ‘tomatoes’ does not define the process that the food has undergone so could not gain full marks.

Suitable answers could have included the following:

Technique	Explanation	Example
Heating	Heating food causes microorganisms and enzymes to be destroyed, and so storage time of food is increased.	UHT milk, soup, sauces, custard. Canned and bottled fruits and vegetables. Pasteurised milk, beer and wine.
Freezing	Freezing prevents growth of some microorganisms, bacteria and moulds and so rate of food spoilage is reduced. Cell activity is stopped. Water in cells is changed to ice and so most of the moisture needed for microbes to grow and enzymes to react is not available.	Frozen meat, fish, bread, fruits, and vegetables.
Dehydration	Removal of water to a level below which micro-organisms can grow means that dehydrated foods can be stored for long periods of time.	Dried meat, fruits and vegetables.
Control of gaseous environment	Modified atmosphere packaging, vacuum packaging and gas vacuum packaging preserve foods because oxygen is removed from the package and so aerobic microbial activity is reduced.	Packaged chips, nuts, and meats.
Use of chemicals and additives	Substances such as sugar, salt, vinegar, alcohol, nitrites and sulphur dioxide are added to foods to delay the growth of micro-organisms by removing water from the cells of the food, so delaying deterioration of the food.	Preserves, jams, pickles, sauces, cured meats.

b. (1.6/4)

Two marks were for the quantity and outcomes of continuous processing and 2 marks for the quantity and outcomes of batch production. This was often not attempted and some answers did not indicate an understanding of the systems given.

Suitable answers could have included the following:

Continuous processing:

Highly automated type of production, which is computer controlled. Can run 24 hours a day, seven days a week and produces large quantities of food. It is more efficient and cost effective than other forms of processing. Sets up costs are high, but running costs are lower. Product is of uniform quality. Examples of food products produced using continuous processing include soft drinks, biscuits and sugar.

Batch production:

Batch production is used when more than a single quantity of a food is required or more than one type of food product is required. May involve the use of an assembly line. Processing begins and continues in steps until the product is completed. The process stops and is then repeated in the processing of the next product. Often used in small businesses such as sandwich shops and bakeries. Usually items produced using this method are more expensive than those that are mass-produced.

Question 9

Parts a and b were very well answered.

a. (1.78/3)

Students needed to provide three points why labelling is important to consumers.

Suitable answers could have included the following:

- labelling is important to consumers so they know what they are buying. It helps consumers to make food choices.
- labelling can assist consumers to avoid particular ingredients that they are allergic to, or choose not to eat (e.g. vegetarians and animal fats).
- it ensures consumers can contact the food manufacturer.
- it tells the consumer the food expiry date so the food is eaten when it is in the best condition and helps identify batch numbers in case food needs to be recalled.

b. (2.63/3)

There was 1 mark for each 3 labelling requirements.

Suitable answers could have included the following:

- name of the food
- name and business address of the manufacturer, packer or importer
- country of origin

- weight or measure of contents
- list of ingredients in descending order by weight
- use by or best before date
- identification of packaging premises and job lot.

c. (1.13/3)

Students were required to list three points about the role of ANZFA but it was poorly answered with few students gaining full marks.

Suitable answers could have included the following:

- ANZFA is responsible for developing, varying and reviewing standards for food available in Australia and New Zealand. It coordinates national food surveillance (including the Australian market basket survey) and coordinates food product recall systems.
- ANZFA conducts research on matters that may be included in a standard. It assesses policies about imported foods – ANZFA develops codes of practice for industry (e.g. Code of practice on nutrient claims in food labels and in advertisements – 1995). It also undertakes food safety education initiatives.

Question 10

a. (3.34/6)

One mark was given for identifying one unsafe food handling or food storage practice and 1 mark for explaining the practice. Students generally were able to identify the unsafe practices but were often unable to explain how each may have led to the outbreak of food poisoning.

Suitable answers could have included the following:

- The unprepared foods may not have been stored correctly. For example, the seafood or chicken may have been stored at the wrong temperature or out of the refrigerator for an extended period of time, allowing food spoilage microorganisms to multiply, and so give the diners food poisoning.
- Cross contamination may have occurred with raw foods such as the seafood or chicken coming into contact with foods such as salad vegetables which were not cooked. This could happen either during storage such as in the refrigerator, or through the use of the same equipment such as chopping boards during food preparation. Microorganisms from the raw foods could contaminate the salad vegetables, and because these are not cooked, these microorganisms could then cause food poisoning.
- Poor food handling habits by the people preparing the food may have caused contamination of the food – such as food handlers not washing their hands before touching the food or after visiting the bathroom. Food may not have been cleaned properly such as fruits in the fruit salad may not have been washed.

b. (0.95/3)

Students needed to provide three points about the HACCP system but this was poorly answered with very few students gaining full marks.

Suitable answers could have included the following:

- It is a preventative approach to the identification of potential hazards and their control points.
- It systematically assesses the ingredients of a food product, the conditions of its processing, handling, storage, transport and packaging.
- Dangerous situations in food preparation and service can be identified and avoided.