

## National Unit Specification: general information

<b>UNIT</b>	Biotechnological Industries (Access 3)
<b>NUMBER</b>	D024 09
<b>COURSE</b>	Biology (Access 3)

### SUMMARY

This unit seeks to develop knowledge and understanding, problem solving and practical abilities related to the applications of biology to industry.

### OUTCOMES

1. Handle information related to biotechnological industries.
2. Carry out practical techniques related to biotechnological industries.

### RECOMMENDED ENTRY

Entry is at the discretion of the centre.

### CREDIT VALUE

1 credit at Access 3.

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### Administrative Information

<b>Superclass:</b>	RH
<b>Publication date:</b>	June 2002
<b>Source:</b>	Scottish Qualifications Authority
<b>Version:</b>	04

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## National Unit Specification: general information (cont)

**UNIT**        Biotechnological Industries (Access 3)

### CORE SKILLS

This unit gives automatic certification of the following:

<b>Complete core skills for the unit</b>	None	
<b>Core skills components for the unit</b>	Planning and Organising	Acc 3

Additional information about core skills is published in the *Catalogue of Core Skills in National Qualifications* (SQA, 2001).

## **National Unit Specification: statement of standards**

### **UNIT        Biotechnological Industries (Access 3)**

Acceptable performance in this unit will be the satisfactory achievement of the standards set out in this part of the unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to the Scottish Qualifications Authority.

#### **OUTCOME 1**

Handle information related to biotechnological industries.

##### **Performance criteria**

- (a) Facts are used correctly in relation to biotechnological industries.
- (b) Relevant information is selected and presented appropriately.
- (c) Conclusions drawn are valid.

##### **Note on range for the outcome**

Biotechnological industries: dairy, yeast-based, detergent, pharmaceutical.

##### **Evidence requirements**

Evidence of an appropriate level of attainment must be generated from a closed book test with items covering all the performance criteria for all of the range.

#### **OUTCOME 2**

Carry out practical techniques related to biotechnological industries.

##### **Performance criteria**

- (a) The procedures are followed accurately and safely.
- (b) Relevant measurements and observations are recorded in an appropriate format.

##### **Note on range of the outcome**

Techniques: resazurin test, yeast immobilisation, biological enzyme assay.

##### **Evidence requirements**

A checklist of the individual work of the candidate must be produced for all of the performance criteria for each technique given in the range. For PC (a) the teacher/lecturer must attest that the candidate has been involved in planning the technique, selecting appropriate resources and carrying out the task.

## **National Unit Specification: support notes**

### **UNIT        Biotechnological Industries (Access 3)**

This part of the unit specification is offered as guidance. The support notes are not mandatory.

While the time allocated to this unit is at the discretion of the centre, the notional design length is  
40 hours.

### **GUIDANCE ON THE CONTENT AND CONTEXT FOR THIS UNIT**

#### **Outcome 1**

##### **1. Dairy industries**

- i        Milk.  
Milk as a food containing sugar, fats, proteins, vitamins and minerals.  
Different processing treatments to produce evaporated milk, skimmed and semi-skimmed milk, pasteurised milk and UHT milk.  
Microbial tests are carried out on milk to test for fitness for consumption.
  
- ii       Yoghurt.  
Bacterial cultures can be added to pasteurised milk to make yoghurt.  
Making yoghurt is a method of preserving milk.
  
- iii      Cheese  
Use of rennet and bacterial cultures in the production of cheese.
  
- iv      Environmental impact.  
Potential impact on the environment of disposal of whey in rivers.  
Upgrading and use of whey.

##### **2. Yeast-based industries**

- i        Bread.  
The use of yeast in bread dough.
  
- ii       Beer.  
The type of yeast, the temperature and the fermentation time affect the alcohol content of the beer produced.  
Cask conditioned beer.  
Brewery conditioned beer.
  
- iii      Fermented milk drinks.  
Produced using an enzyme and yeast.  
Immobilisation technique in the production of fermented milk drinks.
  
- iv      Flavouring and food colouring.

## National Unit Specification: support notes (cont)

### UNIT            Biotechnological Industries (Access 3)

- v      Environmental impact.  
Potential impact on the environment of disposal of waste in rivers from yeast-based industry.  
Upgrading and use of waste.

#### 3.    **Detergent industries**

- i      Production of biological washing powders and liquids.  
Use of enzymes.
- ii     Value and use of product.
- iii    Environmental impact.  
Reduced fuel consumption and pollution.  
Detergents in waste water can be toxic to wildlife.  
Methods of reducing environmental impact.

#### 4.    **Pharmaceutical industries**

- i      Antibiotics.
- ii     Antifungals.

Further detail is given in the course content section of the Intermediate 1 Biology course specification.

#### **Outcome 2**

Suitable techniques for this outcome are:

- resazurin test
- yeast immobilisation
- biological enzyme assay.

### **SPECIAL NEEDS**

This unit specification is intended to ensure that there are no artificial barriers to learning or assessment. Special needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering alternative outcomes for units. For information on these, please refer to the SQA document *Guidance on Special Assessment Arrangements* (SQA, 2001).