

Food production: crop plants

Name two ways a glasshouse increases crop yield.

Food production: crop plants

Why does extra carbon dioxide in a glasshouse increase yield?

Food production: crop plants

Why does too high a temperature in a glasshouse reduce yield?

Food production: crop plants

How do fertilisers increase crop yield?

Food production: crop plants

Why do farmers control pests?

Food production: crop plants

Give two disadvantages of pesticides.

Food production: crop plants

What is biological control?

Food production: crop plants

Give one disadvantage of biological control.

If carbon dioxide is limiting, photosynthesis is faster, so more glucose is made for growth.

It traps heat, so plants are warmer, and protects crops from pests and bad weather. It can also have extra light and carbon dioxide.

They supply mineral ions such as nitrates, so plants can make proteins and grow faster.

Above the optimum, the enzymes of photosynthesis are denatured, so the rate falls.

They can kill non-target organisms, build up in food chains, and pests can become resistant.

Pests eat or damage crops and spread disease, so they reduce yield and quality.

It is slow and may not remove the pest, or the control organism may become a pest itself.

Using a living organism, such as ladybirds eating aphids, to reduce a pest population.

Food production: micro-organisms and fish farming

What is the word equation for anaerobic respiration in yeast?

Food production: micro-organisms and fish farming

Why does bread dough rise?

Food production: micro-organisms and fish farming

What happens to the ethanol when bread is baked?

Food production: micro-organisms and fish farming

In the yeast practical, why is a layer of oil added?

Food production: micro-organisms and fish farming

How can the rate of anaerobic respiration in yeast be measured?

Food production: micro-organisms and fish farming

Name two control variables in the yeast practical.

Food production: micro-organisms and fish farming

In the yeast practical, why is the sugar solution boiled and cooled first?

Food production: micro-organisms and fish farming

Which bacterium makes yoghurt and what does it make?

Yeast respire anaerobically and makes carbon dioxide, whose bubbles are trapped in the dough.

Glucose $\rightarrow$ ethanol + carbon dioxide.

To keep oxygen out, so the yeast respire anaerobically.

It evaporates. The heat also kills the yeast.

Any two from: mass of yeast, volume and concentration of sugar solution, type of sugar, time, depth of oil layer.

Measure the volume of carbon dioxide collected, or count the bubbles, in a set time.

Lactobacillus changes lactose (milk sugar) into lactic acid.

Boiling removes dissolved oxygen. Cooling stops the heat killing the yeast.

Food production: micro-organisms and fish farming

Why is milk pasteurised before making yoghurt?

Food production: micro-organisms and fish farming

How does lactic acid thicken milk?

Food production: micro-organisms and fish farming

What are aseptic precautions in a fermenter?

Food production: micro-organisms and fish farming

Why is a fermenter oxygenated and agitated?

Food production: micro-organisms and fish farming

Why does a fermenter need a cooling jacket and a pH probe?

Food production: micro-organisms and fish farming

Biology only

Why are fish of similar size kept together on a fish farm?

Food production: micro-organisms and fish farming

Biology only

List the points a fish farmer controls.

Food production: micro-organisms and fish farming

Biology only

Why must waste products be removed from fish tanks?

The lower pH makes the milk proteins clump together.

To kill unwanted micro-organisms that could spoil the yoghurt.

Oxygen allows aerobic respiration for growth. Stirring spreads nutrients, oxygen and heat evenly.

Sterilising equipment and nutrients so that unwanted micro-organisms cannot get in.

To reduce intraspecific predation, where larger fish eat smaller fish of the same species.

Respiration releases heat, so cooling keeps the optimum temperature. The pH is kept at the optimum for enzymes.

Faeces and uneaten food release toxic substances such as ammonia, which harm the fish and pollute the water.

Water quality, predation, disease, waste removal, feeding quality and frequency, and selective breeding.

Selective breeding and genetic modification

Define selective breeding.

Selective breeding and genetic modification

Give two characteristics selected for in crop plants.

Selective breeding and genetic modification

Give two characteristics selected for in domesticated animals.

Selective breeding and genetic modification

Why must breeding be repeated over many generations?

Selective breeding and genetic modification

State a disadvantage of selective breeding.

Selective breeding and genetic modification

What does a restriction enzyme do?

Selective breeding and genetic modification

What does ligase do?

Selective breeding and genetic modification

What is a vector in genetic engineering?

Any two: disease resistance, larger fruit or grains, better taste, higher yield.

Humans choosing which organisms to breed so that desired characteristics are passed on to the next generation.

So the desired characteristic is gradually strengthened until it is strongly shown.

Any two: more milk, more meat, more eggs, gentle nature, wool quality.

Cuts DNA at a specific sequence of bases, often leaving sticky ends.

Reduced genetic variation, so one disease or environmental change may affect all individuals. Inbreeding can increase harmful inherited conditions.

A plasmid or virus that takes up a piece of DNA and inserts this recombinant DNA into other cells.

Joins pieces of DNA together.

Selective breeding and genetic modification

What are sticky ends?

Selective breeding and genetic modification

What does transgenic mean?

Selective breeding and genetic modification

Why are bacteria used to make human insulin?

Selective breeding and genetic modification

Name four conditions provided in a fermenter.

Selective breeding and genetic modification

What happens to the insulin after the bacteria have made it?

Selective breeding and genetic modification

How does Bt maize resist insect pests?

Selective breeding and genetic modification

Give two advantages of GM crops.

Selective breeding and genetic modification

Give two concerns about GM crops.

The transfer of genetic material from one species to a different species.

Short, unpaired DNA strands left at a cut, which pair with matching sticky ends.

Any four: aseptic precautions, nutrients, optimum temperature, optimum pH, oxygen, agitation.

They contain the human insulin gene after modification and reproduce quickly in a fermenter, giving large amounts of insulin.

It contains a bacterial gene for a toxin that kills many insect pests.

It is extracted and purified before use.

Any two: possible risk to health, genes spreading to wild plants, toxin harming other insects, ethical worries.

Any two: higher yields, less insecticide needed, extra characteristics such as nutritional value, more food produced.

Cloning **Biology only**

What is micropropagation?

Cloning **Biology only**

What is an explant?

Cloning **Biology only**

Why is aseptic technique needed in micropropagation?

Cloning **Biology only**

Why are micropropagated plants genetically identical?

Cloning **Biology only**

State two uses of micropropagation.

Cloning **Biology only**

What is an enucleated egg cell?

Cloning **Biology only**

What type of nucleus is used to clone a mammal?

Cloning **Biology only**

Outline how Dolly the sheep was cloned.

A small piece of plant tissue taken from the parent plant to be grown in vitro.

Growing new plants from small pieces of tissue (explants) in vitro, in sterile conditions on nutrient medium.

They grow from cells of one parent by mitosis, so they are clones.

To stop bacteria and fungi contaminating the culture.

An egg cell that has had its nucleus removed.

Any two: commercial quantities of plants with desirable characteristics, saving rare plants, producing plants all year round.

A diploid nucleus from a mature cell was put into an enucleated egg, which formed an embryo implanted into a surrogate.

A diploid nucleus from a mature body cell.

Cloning **Biology only**

What is a cloned transgenic animal?

Cloning **Biology only**

**Name a human protein made by
cloned transgenic animals.**

Alpha-1-antitrypsin or a blood clotting factor, often made in milk.

A cloned animal that contains a gene from another species, such as a human gene.