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|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| <p>Food production: crop plants</p> <p><b>Name two ways a glasshouse increases crop yield.</b></p>              | <p>Food production: crop plants</p> <p><b>Why does extra carbon dioxide in a glasshouse increase yield?</b></p> |
| <p>Food production: crop plants</p> <p><b>Why does too high a temperature in a glasshouse reduce yield?</b></p> | <p>Food production: crop plants</p> <p><b>How do fertilisers increase crop yield?</b></p>                       |
| <p>Food production: crop plants</p> <p><b>Why do farmers control pests?</b></p>                                 | <p>Food production: crop plants</p> <p><b>Give two disadvantages of pesticides.</b></p>                         |
| <p>Food production: crop plants</p> <p><b>What is biological control?</b></p>                                   | <p>Food production: crop plants</p> <p><b>Give one disadvantage of biological control.</b></p>                  |

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

Glucose → ethanol + carbon dioxide.

To keep oxygen out, so the yeast respires 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?**

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.**

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.

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

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

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

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

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?**

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?**

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

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

Joins pieces of DNA together.

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

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

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

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

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

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.**

It is extracted and purified before use.

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

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

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

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