S3 Biology BIOTECHNOLOGY Learning outcome checklist

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| Activity | By the end of this unit you should know … |
| Enzymes in Industry- Enzymes recap | * Enzymes are proteins made by cells
* Enzymes speed up biochemical reactions without being used Enzymes are specific (they only work on one substrate)
* Enzymes become denatured at high temperatures
* The optimum condition is when an enzyme works best
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| -Immobilising enzymes | * Immobilised enzymes are held on gel or glass beads so that they can be used repeatedly
* Immobilised lactase enzyme can be used to reduce the lactose level in milk
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| -Enzymes & fruit juice  | * Enzymes which breakdown plant cell walls can be used to extract more juice from fruit
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| -Bio-washing detergent | * Biological washing powders contain enzymes to digest stains
* Biological washing powder can be used to clean clothes at lower temperatures
* Washing clothes at lower water temperatures saves energy and therefore money
* A control experiment is done to compare the experimental results to
* A control experiment should be set up in the same way as the experiment but with the factor thought to be causing the results missing
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| Microorganisms in industry- Fermentation in Yeast | * Fermentation is respiration without oxygen
* Fermentation in yeast produces ethanol and carbon dioxide
* Yeast is a single celled fungus
* Yeast produce ethanol (alcohol) and CO2 by fermentation
* CO2 produced by yeast is used to make bread rise
* ethanol made by yeast is used to make alcoholic drinks& fuel
* Independent variable is the one changed in an experiment
* Dependent variable is the one measured as your results
* Controlled variables must be kept constant for a fair test
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| - Bacteria in Cheese making | * Bacteria are single celled microorganisms
* Bacteria turn the lactose sugar in milk into lactic acid
* Lactic acid makes the milk sour and coagulate (thicken)
* Rennet is an enzyme used to speed up the coagulation of milk in cheese making
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| - Biofuels | * Biofuel is a fuel that is produced through contemporary biological processes
* Biogas (methane) is made by bacteria breaking down animal waste without oxygen
* Bioethanol is made by the fermentation of sugar by yeast
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| Stem cells | * Stem cells are unspecialised cells that can divide to make new cells
* Tissue stem cells make cells from that type of tissue
* Embryonic stem cells can make any type of cell
* Stem cell technology has been used to grow new skin cells for burn victims
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