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 |
| -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 |
| -Enzymes & fruit juice | * Enzymes which breakdown plant cell walls can be used to extract more juice from fruit |
| -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 |
| 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 |
| - 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 |
| - 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 |
| 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 |