

Commentary on candidate 1 evidence

The effect of glucose concentration on respiration in yeast cells

The evidence for this candidate has achieved the following marks for each section of this course assessment component.

Section	Mark available	Mark awarded	Comments	
1 Aim	1	1	The aim of the investigation is clearly stated.	
2 Underlying biology	4	4	<p>Four expanded descriptions/explanations, that are relevant to the aim, are given at a depth appropriate to Higher level:</p> <ul style="list-style-type: none"> ◆ 1 mark (paragraph 2) – description of the action of dehydrogenase enzymes. ◆ 1 mark (paragraph 3, lines 3 – 7) – ‘The pyruvate enters... forms acetyl coenzyme A.’ ◆ 1 mark (paragraph 4, lines 3 – 8) – ‘The electron transport chain... across the inner membrane.’ ◆ 1 mark (paragraph 4, lines 8 – 12) – ‘The flow of the ions... to form water.’ <p>No marks were awarded for the following descriptions/explanations:</p> <ul style="list-style-type: none"> ◆ Paragraph 2 (lines 1 – 4), as this is National 5 content. ◆ Paragraph 2 (lines 4 – 8) – ‘ATP is required... net gain of ATP’ – the information is copied directly from the <i>Higher Human Biology Course Specification</i> and therefore it has not been written in the candidate’s own words. ◆ Paragraph 3 (lines 9 – 12), as the mark was already awarded for ‘dehydrogenase enzymes’, there is not sufficient information added to gain another mark. 	
3 Data collection and handling	5	a	0	Although the independent variable (glucose concentration), key chemicals and measurement of the dependent variable (colour chart) are given, there is too much additional detail given. Too many references to volumes, temperatures and times are given making this description more like a protocol than a summary.

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		b	1	Repeated measurements are included and the raw (unprocessed) data is sufficient ie, 5 concentrations over a suitable range of values (10 to 50%).
		c	0	The heading for the first column in the table is not appropriate for the data as 'control' is not a concentration of glucose. The heading of 'colour' for the rest of the data is appropriate for the numerical data entered, as the candidate has included a chart to show that each number is associated with a particular colour. The average for the 40% glucose entry has been calculated incorrectly.
		d	1	A table of results is included. The information under the heading 'Literature source' states that the experiment was similar to the candidate's experiment. This statement links the data provided with the experiment and the aim of the investigation.
		e	0	No citation is provided. The reference is included beside the table of data.
4 Graphical presentation	4	a	1	The graph produced is based on the candidate's experimental data. A line graph has been selected which is the appropriate format for this data.
		b	1	Both axes have suitable scales.
		c	1	Both axes have suitable labels and units.
		d	0	Not all of the data has been plotted. As the control has been included in the results table from the experiment, this should have been included in the graph as a value for 0% glucose.
5 Analysis	1	1	1	An appropriate calculation has been correctly carried out and values for the independent variable are given. The results of this calculation have then been linked to the aim of the investigation by a statement.

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			<p>This statement links the indirect measurement (colour change) to the dependent variable (rate of respiration).</p> <p>The percentage change should have been calculated from 0 – 50% (not 10 – 50%), but the candidate has not been penalised here as that error has already been taken into account in section 4d.</p>
6 Conclusion	1	0	A valid conclusion is not given. The effect of increasing glucose concentration on the rate of respiration is not described.
7 Evaluation	3	0	<p>No marks were awarded for the following reasons:</p> <ul style="list-style-type: none"> ◆ The reference to repeats is irrelevant as candidates are told to do this in the instructions for candidates. ◆ The point about water baths is incorrect due to the use of the term 'reliable' when it should be 'valid'. ◆ The point about using a colorimeter is incorrect due to the use of the term 'reliable' when it should be 'accurate'. (These are two different errors in the use of the word 'reliable'.)
8 Structure	1	1	An informative title is given and the report flows in a logical manner.
Total	20	12	