

Nutrition

2015 Chief Assessor’s Report

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## Overview

Chief Assessors’ reports give an overview of how students performed in their school and external assessments in relation to the learning requirements, assessment design criteria, and performance standards set out in the relevant subject outline. They provide information and advice regarding the assessment types, the application of the performance standards in school and external assessments, the quality of student performance, and any relevant statistical information.

## School Assessment

The obsolete specific feature AE3 was used in a small number of classes. Teachers should always refer to the current year subject outline available on the SACE Nutrition minisite at the beginning of each school year and update their learning and assessment plan if any changes are required.

Assessment Type 1: Investigations Folio

Tasks undertaken in this assessment type generally covered Core Topics 1, 2, and 4. Once again, it was pleasing to see some observational studies or case studies included in the investigations folio. These tasks provide opportunities for students to demonstrate significant understanding of relationships between concepts from different topics.

An important part of the scientific process is the ability to formulate a relevant prediction. Predictions that underpin investigation tasks may take the form of a formal research hypothesis, a clarifying statement, or a specific question. Teachers should encourage students to not only construct a relevant prediction, but also provide some justification for it in the form of background information relevant to nutrition. Often, the precursor to a prediction is an issue, question, or problem that might ask what is happening or why something is happening. Placing the issue, question, or problem in a nutritional context in an introduction provides scope later in the discussion for students to link their investigation findings or results to the broader nutritional context, thereby giving them an opportunity to demonstrate achievement at higher levels across the specific features being assessed. Successful students provided clear links between nutritional theory and the investigation being carried out (demonstrating their knowledge and understanding of nutritional theory), and used nutritional theory to connect to the aims and outcomes of investigations through all parts of their reports.

The development of a testable hypothesis is crucial for the design practical, as a poor hypothesis will affect a student’s ability to demonstrate achievement against the performance standards in the design proposal and in the report. Teachers should provide feedback at the design proposal stage to identify issues with the hypothesis, and whether or not the data generated will be useful in addressing the hypothesis. The design proposal should be submitted for moderation with the final report.

Teachers are encouraged to provide evidence to support assessment decisions for specific features I1 (design), I3 (laboratory performance), and A3 (work skills). Many teachers choose to combine assessment of design skills and collaboration within one practical. In these tasks, students should submit independently generated designs for assessment; collaboration can then be used as a strategy to refine a chosen design and undertake data collection. Evidence that supports student achievement for A3 and I3 could be in the form of a grid reflecting the key features of A3 and I3, which teachers can use to record their observations of student performance. There are several examples of these grids available in the support materials on the Nutrition minisite. Self-assessment and/or peer assessment are also useful ways to provide evidence of performance.

The specific feature I1 was often generously marked, with many designs lacking sufficient detail. The best examples of student work included a justified hypothesis, detailed information on how variables were controlled and why this was necessary, what type of data would be suitable, how it would be collected, and how the data would be analysed and used to support the hypothesis. Good design practicals provided sufficient detail to allow replication, and also ensured use of repeated measurements to improve reliability and validity.

Students should display relevant findings of investigations in the results section of their reports, accompanied by brief statements of the main patterns and trends in the data. Only data that are essential to addressing the research question and/or hypothesis need to be included. Students should not put summary data tables and graphs in appendices. However, raw data belongs in an appendix and should not be included in the results section.

The discussion section includes interpretation of investigation findings and evaluation of procedures, with suggestions for improvement, and a brief conclusion about the evidence presented. Many students find the analysis of results and evaluation of procedures the most challenging aspect of investigations. Many struggled to connect their practical results to ‘why’ they may have occurred, often just repeating the results section. The assessment of AE2 was often too generous. Many students were able to state a number of improvements, but they often failed to explain why a procedure was flawed or how a suggested change would improve the outcome. Students should clearly connect strengths, weaknesses, random and systematic errors, and improvements to their actual results and discuss what effects these have on their conclusion.

A small number of students also evaluated reliability of data and validity of measures, but the majority of students avoided discussing these two key concepts. Teachers are encouraged to continue to develop clear and informative task sheets that encourage students to use the discussion section of reports to explain findings of investigations in a nutritional context, and to consider sources of error, validity, and reliability to allow achievement at higher levels against the performance standards.

There is no requirement to set a word-count for practical investigations. The number of specific features assessed usually dictates the length of a report, and since this is variable, using a single word-count for all tasks could lead to reports that might be lacking in depth. Teachers should avoid assessing too many specific features within one task; this was a common practice seen at moderation. The strongest students communicate concisely and coherently. Those students who write about every error or improvement they can think of, including those that have little significance or relevance to the data, do not meet the A performance standard for communication.

Issues investigations were presented in two ways, either as a two-part exercise with Part A focused on selection and acknowledgment of information, and Part B most commonly completed as a timed in-class exercise, or as an assignment with free choice of subject and an extended timeline for submission. Students must be guided to narrow down a broad open-ended question to a more specific one that provides scope to present evidence for multiple points of view. For example, one might tentatively ask ‘Why are more people selecting grass-fed beef?’, but this is too broad to be dealt with effectively within the word-limit. Rather, teachers should guide students to develop a suitable question that emerges from the broader topical subject, for example, ‘Is grass-fed beef nutritionally superior to grain-fed beef?’ Broad questions have the potential to limit a student’s ability to achieve at the higher levels of the performance standards because there are too many points to be discussed in great depth within the word-limit.

The chosen question should be discussed with the teacher to ensure that the issue allows for opposing points of views to be expressed, rather than students falling into the trap of presenting a research assignment. Students need to demonstrate their critical literacy and knowledge of Nutrition by presenting different points of view and then concluding with their own informed conclusion.

Some classes and students did not submit any evaluation of their sources or a correctly presented list of sources, and so there was little evidence for assessment of specific feature I2. Students should evaluate information for bias, credibility, accuracy, and suitability (p. 30 of the 2015 subject outline).

Assessment Type 2: Skills and Applications Tasks

The set of tasks should include a range of question types that vary in complexity from recall to those requiring the higher-order skills of application, analysis, and evaluation. Questions that require students to graph data and analyse data from a graph should be included. Previous examination questions are a useful guide to setting test questions, but teachers should modify questions for which published answers are available. It was pleasing to see well-constructed questions in assessment pieces for the option topics.

While marks are used to guide students about how much information is required in each question in tests, the overall grade assigned to a task should be determined using performance standards. A simple conversion of a percentage to a grade does not always accurately reflect the standard achieved by a student. Grades assigned in this way were often too generous for students achieving high marks and sometimes too harsh for students achieving lower marks.

Most students also completed a variety of assignment written work, for example, undertaking dietary analysis or investigating diet-related disorders. Poor task design sometimes made it difficult to confirm assessment decisions, as the task did not clearly communicate all requirements. The specific features being assessed should be clearly stated on the task sheet. Teachers should ensure that task descriptions and specific features being assessed in the learning and assessment plan (LAP) directly correlate with the information on the task sheet to avoid confusion. A lack of clarity might affect a student’s ability to demonstrate achievement against the performance standards.

## External Assessment

Assessment Type 3: Examination

The examination is in two sections. Part 1 contains eight short-answer and analytical questions (100 marks). These questions integrate material from the four compulsory core topics. Part 2 has two questions (20 marks each), of which students respond to the question that corresponds to the option topic that they have studied in class.

The mean score for the 2015 examination was 57%, which was slightly higher than in past years. Previous mean scores were 55% (2014), 52% (2013), and 52% (2012).

Part 1: Short-answer and Analytical Questions

In general, 2 marks are allocated for one well-expressed idea or piece of information, while questions requiring more detailed explanation are usually worth 4 marks and responses are expected to comprise two relevant and connected pieces of information. Questions that have a lower cognitive demand (for example, ‘name’, ‘state’, or ‘label’ style questions) are allocated 1 mark.

Students are discouraged from using the wording of the question as if it was an answer in itself; this simply wastes valuable time and will not be rewarded. Where questions contain multiple parts, students need to be aware of, and connect their answer to, the question stem; doing this reduces the risk of writing generic responses that may have little to do with the question. When writing responses, students should know that sufficient space has already been provided to adequately address the question. Although a spare page is provided at the back of the examination booklet should students require more space, it is good practice for students to attempt to write concise, relevant, and clear responses using correct nutrition terminology in the space provided.

Question 1

This question on certified organic produce had the highest mean score of the examination, with approximately 40% of students attaining full marks. Many correctly identified cost as a disadvantage for consumers, and interpretation of the trend of the data was also well done. The desire of consumers to avoid chemicals in their food was the most common reason for the trend in relation to consumers of certified organic produce.

Question 2

Most students correctly named Aaron to have the higher basal metabolic rate (BMR). Although many students identified a factor that could account for this (the most common responses being gender or increased muscle mass), some did not elaborate on how that factor affected BMR.

The calculation parts of this question were generally well done. The majority of students correctly stated the percentage of Aaron’s daily energy intake that contributed to the thermic effect of food per 24-hour period was 10%. While the BMR calculation was done correctly by many students, some lost marks for failing to round to the nearest whole number. The energy expenditure calculation was not as well done; the most common error was not including the BMR value calculated in 2(b)(ii).

While most students were able to correctly calculate the difference between energy intake and expenditure, few were able to describe the long-term impact on Aaron if this difference were maintained over a long period of time. Those who did this part well focused on potential lifestyle-related disorders.

Question 3

This question covered many facets of the digestive system, and had the lowest mean score of all questions (35%), with less than 1% of candidates achieving full marks. Students struggled to correctly label some parts of the digestive system. The structures most commonly mislabelled were the liver and salivary glands, with many students naming them as the pancreas and mouth, respectively.

Few students provided specific detail of the sphincters that control food entry into, and exit from, the stomach. However, a small number of students were able to describe the role of the lower oesophageal sphincter (cardiac sphincter) and pyloric sphincter in this process.

While a few students seemed to confuse mechanical and chemical digestion, most gave sufficient detail on mechanical digestion to gain full marks for this section. Less well understood was the role of hydrochloric acid in the stomach. Those students who did well in this part correctly identified activation of enzymes required for digestion (for example, the conversion of pepsinogen into pepsin) and inhibiting microbial growth. A less common response was the role of hydrochloric acid in denaturation (‘unfolding’) of proteins.

Most students achieved partial marks for describing the chemical digestion of lipids. Many responses lacked sufficient detail to gain full marks, with few describing the roles of (lingual) lipase and gastric lipase in the process. Most students were able to identify bile as an emulsifier in the small intestine, and provided some detail on the role of pancreatic lipase in breaking down fats into free fatty acids and monoglycerides.

Question 4

This question integrated a number of key ideas from more than one topic. It had the second highest mean score (63%), indicating students had a sound understanding of most of the topic areas.

While knowledge of glycaemic load was poor, most students were able to successfully complete the calculation using the information provided within the food label. The majority of students demonstrated good understanding of the function of food additives, correctly identified breaches of the *Food Standards Australia New Zealand Act 1991*, and were able to adequately explain one aspect of the food label that could ensure consumer protection or safety. Knowledge of complementary proteins was generally good, with most students able to name a specific food example that would improve the protein composition of the meal. The majority of students were also able to correctly state two non-nutritional advantages of selecting microwave cooking over stove-top cooking, with the most common responses linking to socio-economic factors.

Question 5

Many responses tended to simply paraphrase the question resulting in answers that lacked sufficient detail. Although few in number, better quality responses discussed the concept of ‘bone banking’ and acquisition of peak bone mass, and described the impact of hormonal changes across the lifespan as the basis for gender differences. Surprisingly, many students struggled to name an appropriate substitute drink or did not include fortification in their answer.

While some students clearly understood that recommended daily intake (RDI) is a diagnostic tool, and were able to give an educated answer, it was evident that this was an area of weakness for many. However, the psychological aspect of food choice was answered well, as was the last part of this question where students who focused on caffeine and its effect on calcium absorption did well. Students who chose phosphoric acid or high-fructose corn syrup generally had difficulty describing the impact on calcium absorption well.

Question 6

Most students selected the correct figure (the upper figure) but did not provide sufficient detail in the next part of the question. Many responses were too general in nature with poor use of terminology. Higher-level responses included detail of different types of fats (saturated and unsaturated) and described the link between LDL, HDL, cholesterol, and diet-related disorders.

The majority of students were able to name a fat-soluble vitamin and describe the associated deficiency disorder; vitamin A and xerophthalmia was the most common response. The role of omega-3 fatty acid in foetal brain development was the most frequent correct response for the following part, and, while some students were unable to give the full name of a relevant food group, the majority were able to give food examples.

Question 7

The distinction between food spoilage and food poisoning was well answered by some students. Better responses did not simply give examples of food spoilage but also discussed, for example, autolysis as the mechanism underpinning the phenomenon; similarly, better responses made reference to pathogenic microorganisms when discussing food poisoning. Most students correctly identified the independent variable (temperature), as well as providing one relevant constant factor, of which the most popular focused on swabbing technique and incubation time (24 hours). Most students correctly stated that there were two bacterial colonies on the roast chicken after 24 hours at 50°C.

A range of relevant recommendations were provided for the final part of the question by many students. Those responses awarded full marks also provided justifications that were specific and clear. For example, the most common answer related storage conditions for the roast chicken prior to serving to concepts like the ‘danger zone’, and using refrigeration to limit bacterial reproduction.

Question 8

This question showed the second-lowest mean score (45%). It was evident that some students did not understand that resistant starch is a type of fibre, which restricted their ability to answer part (a) effectively. Comparison of the fibre composition of the three types of grains was limited in most instances, as few students made reference to data that could have been derived easily from the graph.

Surprisingly, some students struggled to respond correctly to the next part of the question, but better responses were able to link concepts such as trustworthiness, credibility, and reliability, to the source of the information (a government-funded organisation).

It was evident that some students misread part (c), as they gave excellent descriptions of the function of *insoluble* fibre rather than the required *soluble* fibre. Most students were able to determine that there were 9 grams of soluble fibre per 100 grams of BARLEYmax, and the best answers to part (c)(ii) linked to diet-related disorders such as type 2 diabetes, atherosclerosis, or obesity.

Many students struggled to identify X in the diagram in part (d), and gave general terms like ‘air pocket’ instead of labelling X as ‘diverticula’/‘diverticulum’. Most students could correctly name the disorder, but when asked to provide lifestyle strategies to cope with the disorder, large numbers of students incorrectly provided dietary strategies.

Part 2: Extended-response Questions on Option Topics

Nearly all students attempted this part of the examination, with varying degrees of success. Fewer students attempted Question 9 (Option Topic 1: Global Nutrition and Ecological Sustainability), with the vast majority attempting Question 10 (Option Topic 2: Global Hunger).

In each expended-response question, 16 marks were allocated for content and 4 marks for communication. Both questions were structured with four parts each worth 4 marks, with each well-expressed idea or piece of information worth 2 marks. To achieve maximum communication marks, a response was required to be clear, relevant, well expressed using appropriate nutrition terminology, and organised as a sequential flow of information.

This section of the examination continues to be challenging for many students in terms of comprehension of the question and content knowledge. Students are advised to avoid paraphrasing the question, and to not use introductory and concluding statements; these practices add nothing to the quality of the discussion and waste valuable time. Students need to demonstrate depth and breadth of knowledge and are to be discouraged from ‘recycling’ answers used in previous dot points.

It would be helpful for students to use 5 to 10 minutes to plan their response, by carefully reading the question, highlighting the key terms in each dot point, and drafting a rough response.

Question 9: Global Nutrition and Ecological Sustainability

Dot point 1

Students who correctly answered this dot point were able to name, describe, and then link the unsustainable practice to relevant negative effects on the environment. Many different types of practices were described by students, the most common being excessive use of fertilisers and/or pesticides, and overgrazing, and most described the impact of such practices on the environment quite well. The use of nutrition terminology in this dot point was highly effective.

Dot point 2

This dot point was generally done well, with the most common answer being intercropping/mixed cropping and genetic modification. Many students gave good descriptions of methods and wrote detailed discussions linking these to increased yield, sustainability, and improved food security. Organic farming was also referred to, although students did not necessarily recognise the lower yield issues or make a link to improving soil quality, thus making it a sustainable practice. Some students appeared to misread the question; although they selected good principles, they lost marks by linking these to environmental damage rather than focusing on improving yield.

Dot point 3

This dot point was not addressed well by the majority of students, some of whom did not respond to the dot point at all. Of those who responded, it was apparent that many did not comprehend the processing aspect of the question, choosing to discuss a production method instead. A few students did well by selecting biodegradable packaging, modified atmosphere packaging (MAP), or fortification, and then successfully linking these to increased food security that was ecologically sustainable.

Dot point 4

This dot point produced a variety of responses in terms of government strategies, with most students able to offer relevant suggestions. However, few students were able to link this to sustainable and secure distribution of food.

Question 10: Global Hunger

Dot point 1

While this dot point was mostly well done, some students gave unnecessary background information as an introduction to this dot point, rather than addressing the key points required. Some answers mentioned famine/hunger only in a general sense, or referenced nutritional consequences for the general population/adults rather than children.

Most students discussed the water-borne diseases of typhoid or cholera and connected the main symptom (diarrhoea) to impaired nutrient absorption and/or dehydration, and the possible consequences on physical health (for example, macronutrient and/or micronutrient disorders) and cognitive development.

Dot point 2

This focus of this dot point was how education could assist individuals to minimise food wastage and also maximise nutritional quality and safety of available food. This question was not done well, with many of the responses lacking in detail. For example, many students identified storage or food preparation as important targets for education, but did not provide any further detail or examples, nor did they link back to wastage.

Dot point 3

This dot point was problematic, with few students achieving full marks. Most students were able to name a recent disaster, but then struggled to provide sufficient detail in terms of government strategies. Some students clearly did not read the question stem, as they went on to discuss non-government organisations or discussed the problems associated with short-term aid, both of which were irrelevant. The most common strategy identified was provision of food aid, but few students went on to discuss this in detail, and answers tended to be far too vague.

Dot point 4

It was evident that some students misunderstood key terms in the dot point stem. Two long-term strategies were required and they had to be able to allow communities to increase food production and thereby reduce hunger.

There were a large number of vague answers, especially in reference to education. Students were not very specific, and some repeated answers from dot point 2, thus not worthy of marks. Students also struggled to link strategies to how these would improve community food production and kept answers far too general.

Better responses gave details of two strategies and discussed how these would increase food production. Microfinancing/revolving funds came up quite frequently, and this answer was generally well done.

## Operational Advice

School assessment tasks are set and marked by teachers. Teachers’ assessment decisions are reviewed by moderators. Teacher grades/marks and feedback should be evident on all student school assessment work. This can be helpful for moderators, who are seeking to confirm teacher’s assessment decisions. Individual tasks within an assessment type should not be allocated weightings. Overall grades for an assessment type are best made by reviewing the set of tasks as a whole, assessing each specific feature across all tasks. Teachers should ensure that the grade levels allocated on the sets of work match the grade levels entered on *Schools Online*.

As in past years, moderators appreciated the effort that most teachers put in to preparing teacher materials and the requested student samples. Teacher materials should include a current approved learning and assessment plan (LAP), completed addendums if a LAP has been altered, and a set of task sheets. It is crucial that a completed Variations — Moderation Materials form is submitted if assessment tasks have been modified for students, a breach of rules has occurred, or if work (submitted or not) is missing. Teachers are encouraged to put processes in place that will reduce the likelihood of assessed work being lost. Internal moderation, to ensure consistency of marking standard, should also be undertaken when multiple teachers combine to form a single assessment group.

Student materials were generally well presented. Moderators found it very helpful when a cover sheet with an overall summary of assessment decisions for all tasks, indicating the performance standards used, was included. Evidence, such as printouts of PowerPoint slides, transcripts, cue cards, feedback sheets, or recorded multimedia files on DVD/CD/USB, should be provided to support the assessment of student oral presentations.

Teachers should ensure that complete sets of work for all students in the moderation sample are provided to help moderators confirm teachers’ assessment decisions. It should also be clear that an adjustment has been made to a student’s overall grade if tasks have not been submitted by the student. Formative work and drafts are not to be submitted.

## General Comments

There are several avenues for teachers to seek advice about assessment requirements for Nutrition. Teachers should refer to the subject outline and support materials on the Nutrition minisite for information and advice about each of the school assessment types. Clarifying forums are held early each year and teachers are encouraged to apply to take part in examination marking and moderation. The SACE Officer Curriculum for Nutrition is also available for advice.

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