Unit 3.1.4

Principles of Research

Key Knowledge and Key Skills

Key Knowledge 3.1.4

The principles of research in the development of the Australian Dietary Guidelines and Australian Guide to Healthy Eating, including recognition of credible sources, evidence-based information and accurate analysis of data.

Key Skills 3.1.4

Justify the science behind why the Australian Dietary Guidelines and the Australian Guide to Healthy Eating are credible sources of dietary information.

Key Skills 3.1.7

Apply the healthy eating recommendations of the Australian Dietary Guidelines and Australian Guide to Healthy Eating to the planning of daily food intake and, through practical activities, create nutritious meals to cater to a diverse range of needs.

VCE Food Studies Study Design p. 20 and 21

Terms and Definitions

The **Australian Dietary Guidelines** consist of recommendations on eating for the health and wellbeing of the general population living in Australia.

A **balanced diet** contains a variety of food from the five food groups in proportions that meet individual needs.

The term **credible** means to be worthy of being believed.

The term **diet** refers to the kinds of food that a person or group of people habitually eat.

A **principle** is a rule, belief, or idea that influences someone to make, what they consider, the right decision.

The term **principles of research** refers to the use of research to make informed decisions about a topic or issue.

The term **research** means to study a topic in detail, to find out the facts about a topic or issue to make an educated decision.

The Three Principles of Research

The principles of research refer to the valid use of sources when researching a topic or issue that enables an informed decision to be made. There are three principles of research:

1. credible sources;
2. evidence-based information; and
3. accurate analysis of data.

What is a Credible Source?

Nowadays, nutritional information is readily available from various sources. These include academic articles, books, dieticians, doctors, internet sites, food labels, magazines, naturopaths, newspapers, nutritionists, personal trainers, radio, and television. However, not all of these sources are considered credible. It can be challenging to determine if a source is credible.

Educational Institutions

A range of universities, including Deakin, Edith Cowan, and Monash, conduct thorough research into topics related to nutrition and science. They are generally considered credible sources of information.

Experts in the Field

Sources of nutritional information are considered credible when written by experts qualified in the field that is being researched. A range of medical personnel can be regarded as nutrition experts; these include people who have university qualifications relating to nutritional science.

Accredited Practising Dieticians (APDs) are uniquely qualified to provide tailored nutrition advice for medical conditions. They are experts in food and nutrition and much more reliable sources of information than nutritionists. The term 'nutritionist' is not regulated, which means anyone who has undertaken a nutrition course can call themselves a nutritionist. However, an accredited nutritionist must have a university qualification in nutrition and experience in various nutrition services.

Watch this video to find out more about dietetics: https://youtu.be/XrlxNA1lSdY

Government Organisations, Websites and Campaigns

Government organisations, websites, and campaigns are generally considered credible sources of information. Government organisations and websites are funded by the government and the people working in them are employed by the government. They are likely to be credible sources of nutritional information because they usually seek information, advice, and recommendations from experts.

The Commonwealth Science and Industry Research Organisation (CSIRO) is Australia's government research organisation. CSIRO's nutrition and health research area designs and conducts studies that deliver innovation to Australia's food, health, and wellness industries.

The National Health and Medical Research Council (NHMRC) is the nation's leading expert body in health and medical research. They employ the highest quality health and medical researchers to provide guidelines for healthy eating based on the best available scientific evidence.

The Betterhealth website is an initiative by the Victorian Government that provides a vast range of health and medical information to improve the health and wellbeing of people and communities.

LiveLighter is a campaign funded by the Western Australian Government. It provides various tools and services to help Australians improve their health.

Organisations

There are many other types of organisations, such as not-for-profit organisations, charity organisations, and non-government organisations that provide credible and unbiased information; however, some do not. Some

organisations may strongly advocate a specific viewpoint, particularly, if commercial organisations sponsor them. In this case, it is essential to investigate and determine if the content is credible.

Nutrition Australia is a non-government, non-profit, community-based organisation. It works alongside the federal and state governments, guiding bodies, and health organisations to inspire healthy eating through information, education, and consultation services. They support the promotion of scientific-based information.

Dieticians Australia is a peak body representing over 8000 dietetic and nutrition professions in Australia and overseas. They support and promote evidence-based practice.

The Heart Foundation of Australia is a charity that various companies sponsor.

What is Evidence-based Information?

Evidence-based information refers to information that is based on evidence or proof. Evidence-based information undergoes rigorous scientific testing and research. It often involves peer reviews, controlled randomised testing, systematic reviews of research topics, meta-analysis, and food pattern modelling.

Controlled randomised testing is a form of **clinical trial** and is a fundamental part of clinical research. Clinical trials involve testing a new treatment against a current treatment. Trials are considered essential before deciding whether a new treatment will work and is worth introducing. Controlled randomised testing is a type of clinical trial. In this type of testing, a random group of people are allocated to either the new treatment or the standard one. This allows the two groups to be compared to see which treatment is more effective.

Watch this video to learn more about evidence-based information: https://youtu.be/iqwuR7eC2T0

Food pattern modelling is another type of evidence-based information. Food pattern modelling involves identifying and evaluating any specific changes in the amounts or types of food group recommendations and nutritional needs of the population. By analysing changes in food patterns, researchers can ensure that food meets people's dietary requirements in the quantities recommended.

Meta-analysis is an essential type of research that answers questions that cannot be answered in controlled randomised testing. A meta-analysis combines evidence from multiple studies to answer a research question. For example, a meta-analysis may bring together numerous and varied results from a range of clinical trials. Researchers then analyse this data and give an unbiased and transparent view of all evidence provided.

Peer-reviewed articles are articles that several experts review for quality, accuracy, and relevancy. The peer reviewers provide feedback to the authors, improving the quality and ensuring the reliability of published articles and research. Original research and case study analysis are the types of articles that should be peer-reviewed because the information that is being presented is new.

A **systematic review** is a method used to understand data. Systematic reviews are used to review a lot of data about a particular topic. They collate information and results from all the studies that have been conducted about a topic. They summarise the results, compile the data systematically, and make a recommendation about the credibility and reliability of the data.

Watch this video to learn what is involved in systematic reviews: https://youtu.be/-FQSsnaAtOU

A **systematic literature review** differs from a systematic review. A systematic literature review involves reviewing a variety of literature. This literature may take the form of specific chapters in books, policy documents, and journal articles. A systematic literature review provides a summary and an overall account of what has been done in the area and who conducted the research.

What is an Accurate Analysis of Data?

There are many different methods of collecting data, such as surveys, questionnaires, observations, interviews, and collating measurements. Once data has been collected, researchers analyse the data. As part of this process,

charts, tables, and graphs of the data may be created. The purpose of analysing the data is to look for any patterns, relationships, or trends and then come to a conclusion about the data.

A grading approach to data collection and research is often used when researching, particularly in guideline development. Part of the grading approach involves grading the level of evidence as Grade A, Grade B, etc. Evidence is graded according to factors such as how many people were part of the trial, whether the trial involved randomised or observational testing, and whether a meta-analysis was conducted.

Accurate analysis of data is crucial. A data analyst who incorrectly analyses data scientific findings can lead researchers to believe something that is not true, impacting the credibility of the entire study. An essential component of ensuring data integrity is the accurate and appropriate analysis of research findings.

The Australian Dietary Guidelines and the Australian Guide to Health Eating

The Australian Dietary Guidelines were developed as part of the Eat for Health Program by the NHMRC. The Australian Guide to Healthy Eating forms part of the Australian Dietary Guidelines. The 2013 Australian Dietary Guidelines are currently under review by the NHMRC, with the new guidelines expected to be released in 2024.

The Australian Dietary Guidelines and the Australian Guide to Healthy Eating promote health and wellbeing and aim to reduce the risk of people suffering from diet-related diseases. The dietary advice provided enables Australians to make informed food choices and is based on scientific evidence about food, nutrition, and health. The guidelines apply to the general population in Australia, including those with common health conditions such as overweight or obesity. The advice does not apply to people with specific dietary needs due to old age and serious medical conditions. Consumers, health professionals, educators, and the food industry use the Australian Dietary Guidelines as a source of food information about healthy eating.

Click here to access the Australian Dietary Guidelines.

Click here to access the Australian Guide to Healthy Eating.

Conducting thorough research is essential when developing dietary guidelines; they need to be up-to-date. Scientists often discover new information about the chemical composition of specific foods and how diet can play a role in disease prevention and health promotion. The most up-to-date research must be considered when developing dietary guidelines to validate their accuracy. Research also needs to be conducted into Australians' current state of health and dietary patterns to ensure the guidelines are relevant.

The principles of research were used to develop the Australian Dietary Guidelines and the Australian Guide to Healthy Eating.

Credible Sources

The current Australian Dietary Guidelines were reviewed by a committee of leading experts in nutrition, public health, industry, and consumer issues and overseen by the Council of NHMRC. These leading experts consulted with other experts in food, health, and nutrition around Australia and other parts of the world on the factors influencing dietary choice. They also consulted with and sought feedback from members of the public, industry, government departments, and health professionals.

Evidence-based Information

The best available scientific evidence around food and health was reviewed and used to develop the 2013 Australian Dietary Guidelines. The NHMRC undertook a rigorous and comprehensive process to ensure that the Guidelines reflected the best available scientific evidence around food and health.

The Australian Government conducted a vast amount of research before developing and releasing the Australian Guide to Healthy Eating and the Australian Dietary Guidelines. Conducting research is vital because advances in nutritional science about the role of specific foods in the body and nutrients on health and how diet can play a role in disease prevention and health promotion are constantly evolving. Research also identifies trends and emerging patterns in Australians' state of health and dietary eating patterns. When identified, problems can be quickly addressed using health promotion campaigns and raising awareness.

Evidence-based information undergoes rigorous scientific testing and research. The best available evidence-based principles were used to develop the 2013 revised Australian Dietary Guidelines and the Australian Guide to Healthy Eating. The NHMRC undertook a comprehensive process to ensure that the Guidelines reflected the best available

scientific evidence about food and health. They collated all the relevant and reliable findings, which enabled them to make accurate and informed decisions.

The NHMRC used the following evidence-based principles:

- A **systematic literature review** of evidence about diet, disease, food, and health.
- Considered 218 submissions from organisations and businesses such as Diabetes Australia, Home Economics Institute of Australia, Osteoporosis Australia, Sanitarium Health and Wellbeing and SPC Ardmona.
- Data analysis to understand Australians' current dietary intake and health status. This information was then used to ensure the Australian Dietary Guidelines were achievable, practical, and relevant for many Australians.
- Employed a team of nutrition and medical experts to peer-review over 55,000 pieces of published scientific research about diet, food, and health.
- Employed an independent methodologist to ensure that all the data and research conducted were accurate, consistent, and non-biased. This also meant their work was rechecked for accuracy by experts in nutrition research.
- Food pattern modelling of around 100 different dietary patterns. This food modelling analysis explained how possible changes to food-based dietary recommendations would potentially affect peoples' ability to meet their nutritional needs. The evidence produced from the food pattern modelling guided the revision of the Australian Guide to Healthy Eating and similar resources.
- The use of some Grade A evidence statements to demonstrate a convincing relationship between nutrition, diet, and health. The use of a significant amount of Grade B evidence that mostly supported the recommendations and assessed the data for strength of evidence, number, and type of people in the study and relevance.

Accurate Analysis of Data

In terms of the quality of research used, several Grade A evidence statements were used, which demonstrated a convincing relationship between nutrition, diet, and health. However, most evidence statements were of a B grading, indicating that the evidence mostly supported the recommendations. All data were assessed for strength of evidence, number, and type of people in the study and relevance.

Data analysis was likely used to help the experts understand Australians' current dietary intake and health status. This information may have been used to ensure the Australian Dietary Guidelines were practical, relevant, and achievable for many Australians. To ensure their data analysis was accurate, the NHMRC employed an independent methodologist to ensure that all the data and research conducted was accurate, non-biased, and consistent. This also meant that their work was rechecked to confirm accuracy by experts in nutrition research.

Watch this video about the development of the 2013 Australian Dietary Guidelines.https://youtu.be/t_VDuLdv8Gk

Written Activity One

What Should Nellie Eat?

Nellie is a young teenager who has been searching the internet to find out what kind of foods she should be eating.

Answer the following questions:

1. Where should Nellie search for information about healthy eating? Why should she look for information there?

2. Where shouldn't Nellie look for information about healthy eating? Why shouldn't she look for information there?

3. Explain to Nellie what the Australian Dietary Guidelines and The Australian Guide to Healthy Eating are.

4. Explain to Nellie why the Australian Dietary Guidelines and The Australian Guide to Healthy Eating are considered valuable nutritional advice.

Written Activity Two

Advertisment

In small groups, design an advertisement that promotes the Australian Dietary Guidelines and the Australian Guide to Healthy Eating as being valuable sources of nutritional information for Australians.

In your article refer to the credible sources, evidence-based information and accurate analysis of data used in their development.

Practical Activity One

Eat for Health Salads

Production

In this activity, the class will divide into small groups to make a selection of salads.

Visit the links below to access the recipes for the salad recipes on the Eat for Health website.

- Citrus Coleslaw
- Salsa
- Mexican Corn Salad
- Warm Roasted Vegetable Salad
- Chickpea and Couscous Salad
- Ratatouille
- Tuna and Avocado Salad

Sensory Evaluation

Conduct a sensory analysis on three of the salad recipes.

Think of a descriptive word describing appearance, taste, texture, and aroma. **Write** your responses below.

Name of Salad	Appearance	Texture	Taste	Aroma

Evaluation Questions

These salad recipes were sourced from the Eat for Health website.

1. Why is the Eat for Health website considered a credible source of information?

2. What kind of information is found on the Eat for Health website?

3. What are the three principles of research?

4. Explain how the three principles of research were used in the development of the Australian Dietary Guidelines and the Australian Guide to Healthy Eating.

Summary Activity

What is the main idea about the key knowledge & key skills?		
What are the three principles of research? Briefly define each of these and list an example of each.		
Make brief notes about why the Australian Dietary Guidelines meet each of the principles of research.		
Make an overall statement that explains why the Australian Dietary Guidelines are considered a credible source of information.		

Exam Preparation

Section A - Multiple Choice Questions (5 marks)

Question 1

Which of the following is not one of the three principles of research?

a. Credible sources.
b. Evidence-based data.
c. Accurate analysis of data.
d. Evidence-based information.

Question 2

What is not considered a credible source of information?

a. Government website.
b. Nutritional blogger.
c. Educational institutions.
d. Dietician.

Question 3

Which of the following is an example of the evidence-based information used in the development of the Australian Dietary Guidelines?

a. Scientific review of 150 websites about fad foods.
b. Interviews with naturopaths.
c. Over 55,000 pieces of peer-reviewed published scientific research about food, diet, and health
d. Data analysis.

Question 4

When analysing data, scientists may look for:

a. Patterns, relationships, or trends.
b. News reports.
c. Advertisements.
d. Television announcements.

Question 5

The Australian Dietary Guidelines and the Australian Guide to Healthy Eating have been developed using:

a. international data that has been rigorously tested.
b. Data from the 1980s.
c. evidence from overseas.
d. the latest evidence and expert opinion.

Section B – Short Answer Responses (10 marks)

Question 1 (6 marks)

List the three principles of research and provide an example of each.

Principles of Research			
Examples			

Question 2 (4 marks)

Justify why Australians should trust that the Australian Dietary Guidelines are accurate.

Exam Preparation

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List the three principles of research and provide an example of each.

Principles of Research	Credible sources	Evidence-based information	Accurate analysis of data
Examples	An expert in the field, such as a dietician.	Peer-reviewed articles.	Researchers grade the data.

Question 2 (4 marks)

Justify why Australians should trust that the Australian Dietary Guidelines are accurate.

Any two of the following responses were accepted:

- Australians should follow the Australian Dietary Guidelines because they were developed by the Australian government to promote health and wellbeing and aim to reduce the risk of people suffering from diet-related diseases.
- The information in the dietary guidelines is based on scientific evidence about food, nutrition, and health.
- The Australian Dietary Guidelines were developed by a credible committee of leading experts in nutrition, public health, industry, and consumer issues and overseen by the Council of NHMRC.
- The best available scientific evidence around food and health was reviewed and used to develop the 2013 Australian Dietary Guidelines. This included systematic literature reviews of over 55,000 pieces of information.
- The NHMRC employed an independent methodologist to analyse the data and ensure it was accurate, non-biased, and consistent. This also meant that all information was rechecked to confirm accuracy by experts in nutrition research.

Starter Activity One

List as many credible sources of nutrition information as possible.

List as many non-credible sources of nutrition information as possible.

Brainstorm as many types of evidence-based information as you can.

Brainstorm the type of information you can access on the Eat for Health Website.