

"DON'T ASK ME ABOUT MY PROTEIN"

Kate Strong and the Science of Vegan Performance



Introduction

At GCSE, PE students are required to have knowledge of diet, nutrition and hydration and apply it to real-world sporting contexts. This task does exactly that; the questions are anchored to a real athlete's story but require pupils to draw on prior knowledge to answer them well. Questions 1–2 test recall and identification. Questions 3–5 require pupils to explain physiological and nutritional principles using the case study as a hook. Question 6 mirrors the extended evaluate/assess question format used across AQA, Edexcel and OCR. The vegan framing is essential throughout – Kate Strong's case study is the scenario that drives every question, and the Vegan and Thriving campaign provides the context for Q5's protein–assumptions question.

Relevant Links

Vegan athlete Kate Strong accomplishes three cycling world records – [The Vegan Society](#)

Kate Strong's profile in the Vegan and Thriving Campaign – [The Vegan Society](#)

Vegan and Thriving campaign – [The Vegan Society](#)

TASK OVERVIEW

Timing
20–30
minutes

Setting
classroom

Curriculum links

AQA GCSE Physical Education (8582): (3.2.3.3)

Energy use, diet, nutrition and hydration.

Pearson Edexcel GCSE (9–1) Physical Education:

(1.3) Energy use, diet, nutrition and hydration.

OCR GCSE (9–1) Physical Education (J587): (2c.2.)

Diet and nutrition.

What you'll need

Student Question Worksheet.

Additional resources

Pens.

Prior knowledge needed

This task is an application and consolidation activity. Students will need prior knowledge of the following:

- The role of carbohydrate, protein and fat in a balanced diet, including the approximate ratio.
- Carbohydrate as the body's main and preferred energy source at all exercise intensities.
- Protein's role in the growth and repair of muscle tissue, and elevated protein requirements for athletes compared to the general population.
- The principle of carbohydrate loading for endurance athletes and protein timing for power/strength athletes.
- Sources of protein in a vegan diet (e.g. tofu, lentils, beans, chickpeas, peanut butter).
- Basic understanding of how respiratory function affects exercise performance.

Before the lesson

- Print the Student Question Worksheet (1 per student, ideally double-sided).
- Optional: Print the answer grid (appendix A) at the end of this document for self/peer assessment (1 per pair).

Learning Objectives

1. Apply prior knowledge of diet, nutrition and hydration to a real athlete case study.



Important note on framing

Keep the framing evidence-led. The task is not designed to argue that a vegan diet is superior for athletic performance – only to demonstrate, through a real example, that it can support elite performance when well planned.

The Task

Timings are a guide – adjust them to suit your class.

Introduction – [3 minutes]

- Consider using the 'Prior knowledge needed for this task' list to allow students some independent revision time.

Suggested teacher script

- Today you will be applying your knowledge of diet, nutrition and hydration to a real athlete case study by answering some exam-style questions.
- Use this list [write the list on the board] to focus your revision in preparation for answering these questions.

Task – [15–20 minutes]

- Students work individually to read through the case study and answer the questions on the worksheet.
- You can judge whether there needs to be class discussion before answering the questions, especially for Q6 which focuses on protein-rich foods in a vegan diet.
 - Option A: This could be done by asking pairs to write down everything they already know about protein sources and what an athlete needs and then take verbal answers and fill any gaps using the probing questions below.
 - Option B: keep it teacher-led using the suggested script below if required.
- For the answers, see appendix A at the end of this

document. You can mark them or use the grid at the bottom for self/peer assessment.

Suggested probing questions

- What foods do you think of when I say 'protein'?
- Can you think of foods that contain protein but aren't meat, fish, dairy or eggs?
- Do athletes need more or less protein than someone who doesn't train, why?
- Think about what protein does in the body, why would an athlete care about it more than someone sitting at a desk all day?

Suggested teacher script

- Firstly, let's consider, what do athletes need from protein? Protein is essential for muscle growth and repair. Athletes need more protein than the average person – roughly 1.2 to 2 grams per kilogram of bodyweight per day, depending on whether they're an endurance or strength athlete.
- Though, let's also consider whether a vegan diet can actually deliver that and it absolutely can, but it needs to be planned. Plant-based sources of protein include things like tofu, lentils, chickpeas, kidney beans and peanut butter. If you eat a variety of these options across the day, you can get all the amino acids you need and absolutely hit an athlete's protein targets just like you will see Kate Strong do in the extract.

Differentiation

Support – you could opt to read the case study aloud as a class before the students begin answering the questions. There are sentence starters included in the worksheet for Q6. There is also the possibility to reduce the number of questions to be answered, e.g. Q1, Q3, Q4 and Q6 (in which the latter can be answered in bullet points).

Stretch – encourage students to use their own knowledge to strengthen or challenge the statement in Q6.

Note: Appendix A on next page

APPENDIX A *Indicative content for Q1–Q6.*

Q1	1 mark	Endurance training. Accept: aerobic training, cardiovascular training, continuous training.
	2 marks (1 per point)	Any two of: sustained aerobic energy demand over 24 hours; depletion of glycogen/carbohydrate stores requiring ongoing refuelling; muscle fatigue from repeated effort; dehydration risk from prolonged sweating; increased heart rate and body temperature sustained over a long period.
	3 marks	The case study states that after removing dairy, Kate Strong's breathing improved within weeks (1); improved respiratory function means she could take in more oxygen during exercise (1); greater oxygen availability supports working at a higher aerobic intensity (1). Note: credit answers that stay close to what the source actually claims.
	3 marks	Carbohydrate is the body's main and preferred energy source at all exercise intensities (1); during sustained endurance exercise the body relies heavily on glycogen stores derived from carbohydrate (1); over 24 hours these stores would deplete and need replenishing, making adequate carbohydrate intake critical to maintaining performance (1).
	4 marks	The quote suggests people commonly assume vegan athletes cannot get enough protein from their diet (1); this reflects a widespread misconception that protein only comes from animal sources (1); a vegan athlete can meet protein requirements through plant-based sources such as tofu, lentils, chickpeas, kidney beans, peanut butter or fortified plant milks (1 for at least two named sources); these can be spread across meals throughout the day to meet the elevated requirements of an athlete (1.2–2g per kg bodyweight per day depending on sport type) (1). Award up to 4 marks; the question requires both the observation about the assumption and the practical application of vegan protein knowledge.
	6 marks	Answer could: use the case study as evidence (Kate Strong completed a 24-hour endurance event and set world records on a vegan diet), reference at least one specific nutritional principle (e.g. protein requirements can be met from plant sources, or carbohydrate is the main fuel for endurance performance), consider the limitations – this is one case study, causation vs correlation, individual variation, the need for planning and reach a reasoned conclusion (a vegan diet can support elite performance when well planned). A strong answer encompasses the case study's direct evidence that a vegan diet can support elite endurance performance, acknowledges that this is one case study and cannot establish causation or generalise to all athletes, and draws on own knowledge (named plant-based protein sources, or carbohydrate as the main fuel for endurance) to show the nutritional basis is sound.