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NEW ZEALAND QUALIFICATIONS AUTHORITY
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Level 1 Biology, 2016

90929 Demonstrate understanding of biological ideas relating to a mammal(s) as a consumer(s)

9.30 a.m. Wednesday 23 November 2016
Credits: Three

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of biological ideas relating to a mammal(s) as a consumer(s).	Demonstrate in-depth understanding of biological ideas relating to a mammal(s) as a consumer(s).	Demonstrate comprehensive understanding of biological ideas relating to a mammal(s) as a consumer(s).

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should attempt ALL the questions in this booklet.

If you need more space for any answer, use the page(s) provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–8 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

TOTAL

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QUESTION ONE: PHYSICAL AND CHEMICAL DIGESTION IN A CARNIVORE

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www.biolib.cz/IMG/GAL/40325.jpg

http://images.otagomuseum.govt.nz:8080/img/collectionitem/nc/2013/nc2011-74_1!pub.jpg?width=590

The kekeno, or the New Zealand fur seal (*Arctocephalus forsteri*), is a marine carnivore that eats mainly squid and fish. Seals, like other mammals, depend on both physical (mechanical) and chemical digestion to process the food that they eat.

Compare and contrast physical and chemical digestion, discussing these processes with respect to the structures and functions of the digestive system of a typical carnivore such as the kekeno / seal.

Your answer should:

- describe the processes of physical and chemical digestion, and explain how they are different
- explain why both processes are necessary to gain maximum nutrient value from the food eaten
- use specific examples of physical and chemical digestion in a carnivore like the kekeno / seal.

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QUESTION TWO: RESPIRATION

When running a marathon, the muscles of a runner must contract and relax to generate movement for a distance of 42 kilometres. This can take from two to five hours, requiring a large amount of energy to be produced by the muscle cells through the process of respiration, and a large supply of the raw materials needed for respiration. Some of these raw materials are provided by eating selected food leading up to the race, and absorbing the digested nutrients.

Students were provided with four food samples, and carried out a range of tests on all samples.

Test results for food samples

Test	**Test for starch**	**Test for glucose**	**Test for proteins**	**Test for lipids**
Positive result	blue-black colour	orange-red colour	violet-purple colour	see-through
Food sample A	orange	orange-red	pale blue	not see-through
Food sample B	blue-black	blue	pale blue	not see-through
Food sample C	orange	blue	pale blue	see-through
Food sample D	orange	blue	violet-purple	not see-through

Discuss which food sample the students should recommend for a marathon runner to eat leading up to the race, considering the energy requirements of the runner's muscles as they carry out the process of respiration.

Your answer should:

- describe the two types of cellular respiration, including the raw materials used for each process
- explain which type of cellular respiration would be more beneficial for the runner during the marathon race
- explain how some of the raw materials needed for respiration are absorbed in the small intestine and transported to the runner's muscles
- justify your choice of food sample.

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QUESTION THREE: ENZYMES AND pH IN A HERBIVORE AND AN OMNIVORE

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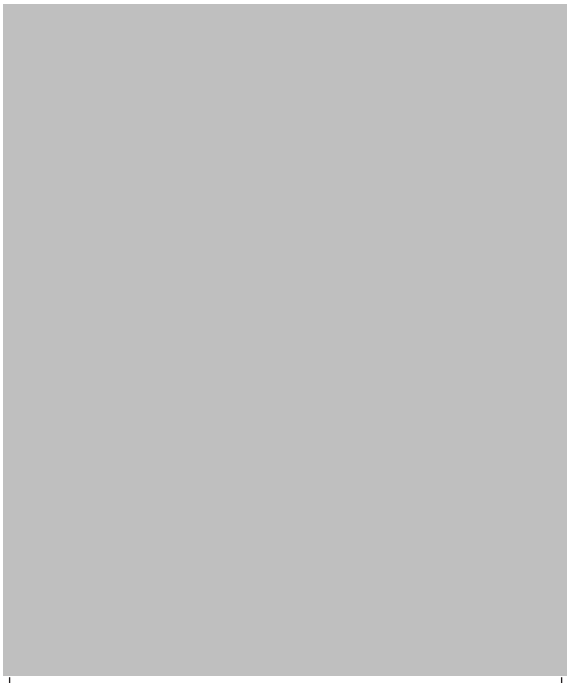
www.hygain.com.au/horses-digestive-system/



www.2beingwell.com/wp-content/uploads /2013/11/digestive-system.jpg

The horse is a herbivore, consuming only plant material, whereas the human is an omnivore, consuming a wide range of foods. Both horses and humans have a range of enzymes in their digestive systems.

Discuss the role of specific enzymes within the digestive systems of a herbivore such as a horse and an omnivore such as a human, including the way that optimum pH levels are maintained.

Your answer should:

- describe the specific function of digestive enzymes within a herbivore such as a horse and an omnivore such as a human
- explain how pH can affect enzyme activity
- discuss similarities between how enzymes function in the digestive systems of a herbivore such as a horse and an omnivore such as a human, AND how optimum pH is maintained in different parts of these digestive systems.

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Extra paper if required.
Write the question number(s) if applicable.

QUESTION NUMBER

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