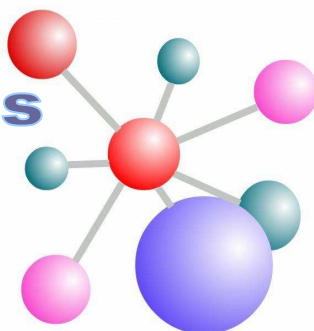


Inglês



Ciências Exatas e da Terra

Instruções

- | | |
|-----------|--|
| 1 | Confira se os dados contidos na parte inferior desta capa estão corretos e, em seguida, assine no espaço reservado para isso.
Se, em qualquer outro local deste Caderno, você assinar, rubricar, escrever mensagem, etc., será excluído do Exame. |
| 2 | Este Caderno contém 05 questões discursivas referentes à Prova da Língua Estrangeira escolhida pelo candidato. Não destaque nenhuma folha. |
| 3 | Se o Caderno estiver incompleto ou contiver imperfeição gráfica que impeça a leitura, solicite imediatamente ao Fiscal que o substitua. |
| 4 | Será avaliado apenas o que estiver escrito no espaço reservado para cada resposta, razão por que os rascunhos não serão considerados. |
| 5 | Escreva de modo legível, pois dúvida gerada por grafia, sinal ou rasura implicará redução de pontos. |
| 6 | Só será permitido o uso de dicionário INGLÊS/INGLÊS. |
| 7 | Use exclusivamente caneta esferográfica, confeccionada em material transparente, de tinta preta ou azul. Em nenhuma hipótese se avaliará resposta escrita com grafite. |
| 8 | Utilize para rascunhos o verso de cada página deste Caderno. |
| 9 | Você dispõe de, no máximo, três horas, para responder as 5 questões que constituem a Prova. |
| 10 | Antes de retirar-se definitivamente da sala, devolva ao Fiscal este Caderno. |

Assinatura do Candidato: _____

As questões de 01 a 05, cujas respostas deverão ser redigidas EM PORTUGUÊS, referem-se ao texto abaixo.

Food nanotechnology – an overview

Bhupinder S Sekhon

Food nanotechnology is an area of emerging interest and opens up a whole universe of new possibilities for the food industry. The basic categories of nanotechnology applications and functionalities currently in the development of food packaging include: the improvement of plastic materials barriers, the incorporation of active components that can deliver functional attributes beyond those of conventional active packaging, and the sensing and signaling of relevant information. Nano food packaging materials may extend food life, improve food safety, alert consumers that food is contaminated or spoiled, repair tears in packaging, and even release preservatives to extend the life of the food in the package. Nanotechnology applications in the food industry can be utilized to detect bacteria in packaging, or produce stronger flavors and color quality, and safety by increasing the barrier properties. Nanotechnology holds great promise to provide benefits not just within food products but also around food products. In fact, nanotechnology introduces new chances for innovation in the food industry at immense speed, but uncertainty and health concerns are also emerging. EU/WE/global legislation for the regulation of nanotechnology in food are meager. Moreover, current legislation appears unsuitable to nanotechnology specificity.

The word “nano” comes from the Greek for “dwarf”. A nanometer is a thousandth of a thousandth of a thousandth of a meter (10^{-9} m). One nanometer is about 60,000 times smaller than a human hair in diameter or the size of a virus, a typical sheet of paper is about 100,000 nm thick, a red blood cell is about 2,000 to 5,000 nm in size, and the diameter of DNA is in the range of 2.5 nm. Therefore, nanotechnology deals with matter that ranges from one-half the diameter of DNA up to 1/20 the size of a red blood cell. Further, it is interesting to note that nanomaterials are so small, even bacteria would need a microscope to see them. Nanoparticles are generally accepted as those with a particle size below 100 nanometers where unique phenomena enable novel applications and benefits. Nanomaterials on which most of the research has been carried out are normally powders composed of nanoparticles which exhibit properties that are different from powders of the same chemical composition, but with much larger particles. Research is in progress into their potential in food nanotechnology sector including food packaging, foods and supplements due to their unique functions and applications of nanomaterials. Tens of millions of dollars are being spent in a global race to apply nanotechnologies in food production, processing and packaging.

Many natural foods contain nanoscale components and their properties are determined by their structure. These have been eaten safely for generations. In fact, some of food’s most important raw materials [proteins, starches, and fats] undergo structural changes at the nanometer and micrometer scales during normal food processing. Food proteins (for example, native beta-lactoglobulin, which is about 3.6 nm in length) can undergo denaturation (via pressure, heat, pH, etc.) and the denatured components reassemble to form larger structures, like fibrils or aggregates, which in turn can be assembled to form even larger gel networks (eg, yogurt). Self-assembled nanotubes from hydrolyzed milk protein α -lactalbumin, a potential new carrier for nanoencapsulation of nutrients, supplements, and pharmaceuticals, have been reported.

Fonte: Nanotechnology, Science and Applications 2010:3 1–15

Questão 1

O texto aponta diversas possibilidades de aplicação da nanotecnologia. Cite as que estão vinculadas ao armazenamento de comida.

Espaço para Resposta

Questão 2

Quais são os benefícios que embalagens de comida produzidas com o uso da nanotecnologia podem trazer?

Espaço para Resposta

Questão 3

De que são compostos os nanomateriais?

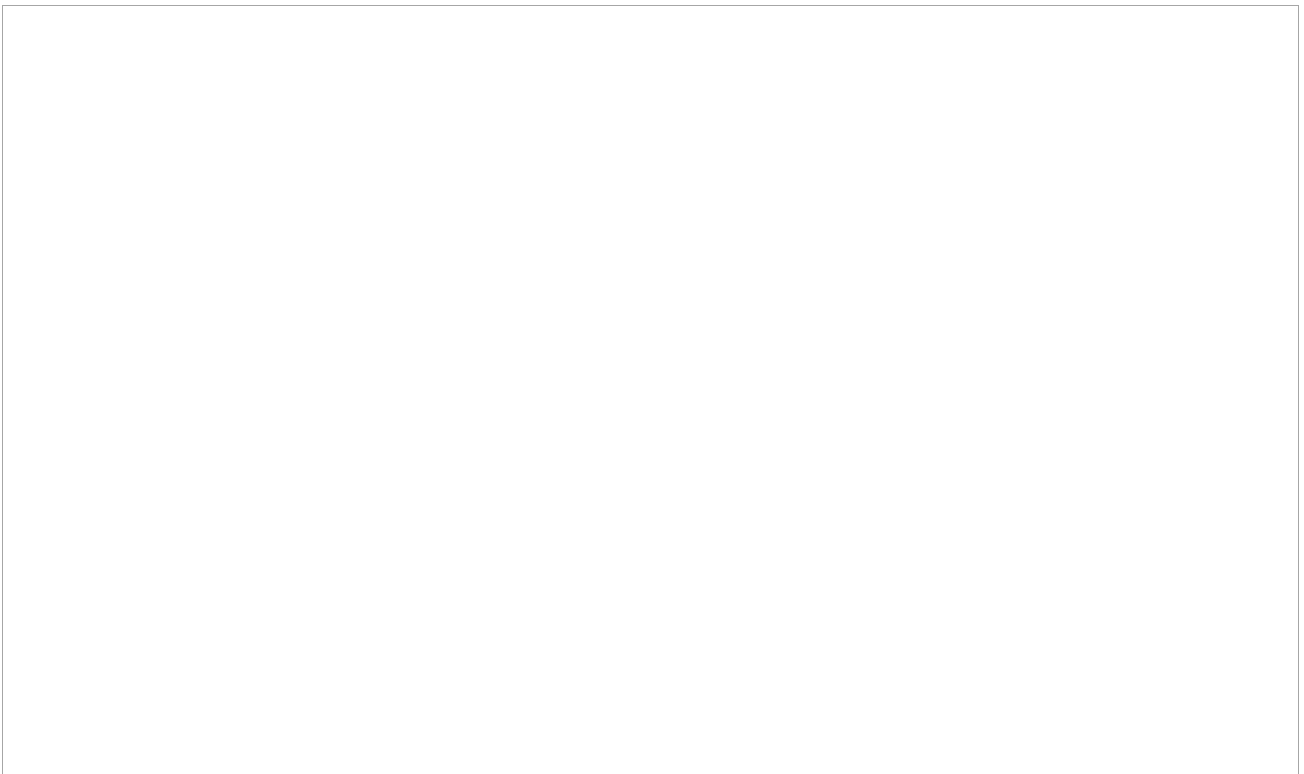
Espaço para Resposta

A large, empty rectangular box with a thin black border, intended for the student to write their answer to Question 3.

Questão 4

Descreva o processo a que podem ser submetidas proteínas dos alimentos do exemplo dado no texto.

Espaço para Resposta

A large, empty rectangular box with a thin black border, intended for the student to write their answer to Question 4.

