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## **CNBC-CCN**

**CNBC Certified Clinical Nutritionist (CCN)**



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## Question: 1

The adequate intake of water for lactating women is which of the following?

- A. 1.3 L/day
- B. 3.3 L/day
- C. 2.7 L/day
- D. 3.8 L/day

**Answer: D**

Explanation:

The adequate intake of water for lactating women is 3.8 liters per day. This recommendation is set to ensure that lactating women are adequately hydrated to support milk production and maintain overall health. Lactation increases the body's fluid requirements due to the significant amount of water used in the production of breast milk.

The best source of water to meet this increased need is plain drinking water, as it provides hydration without added sugars or calories. Beverages such as milk, juice, and herbal teas can also contribute to fluid intake, but it is advisable to consume these in moderation due to their additional caloric and sugar content.

It is essential for lactating women to monitor their hydration status and drink water regularly throughout the day. Signs of dehydration can include thirst, reduced urine output, and darker urine. Maintaining proper hydration is crucial not only for milk production but also for the mother's overall health.

In summary, the recommended adequate intake of water for lactating women is 3.8 L/day, primarily from drinking water and supplemented by other beverages. This ensures that both the nutritional needs of the baby and the health of the mother are supported during the lactation period.

## Question: 2

Positive water balance is an excess accumulation of water in the body. It causes:

- A. edema
- B. heart disease
- C. diabetes
- D. none of the above

**Answer: A**

Explanation:

Edema is the swelling caused by the excessive accumulation of fluid in the body's tissues. This condition arises when there is a positive water balance, meaning the body retains more water than it excretes.

The primary areas affected are often the feet, ankles, and legs, but edema can also occur in the hands, arms, face, and other body parts.

The causes of edema are varied but can include prolonged standing or sitting, high salt intake, and certain medical conditions. When there is an excess of sodium in the diet, the body holds onto water to maintain a balanced concentration of salts in its cells. This retention of water increases the volume of fluid in the interstitial spaces – the areas between cells – leading to swelling.

Moreover, edema can add pressure to the walls of arteries and veins, potentially contributing to increased blood pressure, or hypertension. This is because the extra fluid in the tissues makes it harder for blood to flow normally, putting additional strain on the blood vessels.

In managing edema, especially when linked to positive water balance, reducing sodium intake is commonly recommended. This dietary adjustment helps decrease water retention, alleviating the swelling and the pressure on blood vessels, which can indirectly help manage or prevent hypertension. In summary, a positive water balance can lead to edema by causing abnormal fluid retention in the body. This condition not only results in visible swelling but can also contribute to more severe health issues like hypertension, making management of salt intake and fluid balance crucial.

### Question: 3

Which vitamin maintains calcium?

- A. K
- B. D
- C. C
- D. A

**Answer: B**

Explanation:

Vitamin D plays a critical role in the body's ability to regulate calcium and phosphorus levels, which are vital for maintaining healthy bones and teeth. Unlike many other vitamins, Vitamin D functions like a hormone, and every cell in your body has a receptor for it.

Vitamin D is unique because it can be synthesized by the body through sunlight exposure. When ultraviolet (UV) rays from sunlight strike the skin, they trigger vitamin D synthesis. However, due to factors such as living in high latitudes, winter season, wearing sunscreen, spending much time indoors, or having darker skin (which has more melanin that can block UV rays), many people do not produce enough vitamin D.

In addition to its production through sunlight exposure, Vitamin D can be obtained from certain foods, although it is naturally present in only a few. These include fatty fish like salmon and mackerel, fish liver oils, and small amounts in beef liver, cheese, and egg yolks. Some foods and beverages, like milk, orange juice, and cereals, are fortified with Vitamin D to help prevent deficiencies.

The primary function of Vitamin D is to maintain proper levels of calcium and phosphorus in the blood. It achieves this by enhancing the intestinal absorption of calcium, which helps to form and maintain strong bones. Without sufficient vitamin D, bones can become thin, brittle, or misshapen. This deficiency leads to conditions such as rickets in children and osteomalacia or osteoporosis in adults.

Moreover, recent studies suggest that Vitamin D may go beyond bone health, potentially influencing immune function, reducing inflammation, and playing roles in heart health and prevention of certain

cancers. The importance of maintaining adequate levels of this vitamin cannot be overstated, as its deficiency has been linked to various health issues beyond bone disorders.

Given its crucial functions and the fact that deficiency is relatively common, health professionals often recommend vitamin D supplements, especially for individuals at risk of inadequate sun exposure or dietary intake. It is always advisable to check vitamin D levels through medical testing and consult healthcare providers for appropriate supplementation and safe sun exposure practices to maintain optimal health.

### Question: 4

All of the following are recommendations for diet therapy in an infant with ketosis except:

- A. sufficient calories and nutrients but with extremely restricted amounts of leucine, isoleucine and valine
- B. a special formula
- C. low-protein foods
- D. high-protein foods

**Answer: D**

Explanation:

Ketosis in infants can be a result of metabolic disorders such as maple syrup urine disease (MSUD), which involves an inability to process certain amino acids. The management of such conditions requires a specific dietary approach tailored to reduce the intake of problematic nutrients while ensuring overall nutritional needs are met. Here's an expanded explanation of the dietary recommendations for infants with ketosis, with an emphasis on identifying which of the listed options is not recommended.

**\*\*Sufficient calories and nutrients but with extremely restricted amounts of leucine, isoleucine, and valine\*\***: This recommendation is crucial for infants diagnosed with MSUD because these branched-chain amino acids (BCAAs) are not properly metabolized due to enzyme deficiencies. The diet must provide enough energy and other nutrients to support growth and development while strictly limiting the intake of leucine, isoleucine, and valine to prevent toxic buildup, which can lead to serious health issues, including ketosis and acidosis.

**\*\*A special formula\*\***: Infants with metabolic disorders like MSUD often require specially formulated feeds. These formulas are designed to be low in problematic amino acids (such as leucine, isoleucine, and valine) while still providing other essential nutrients. Such formulas help manage the condition by preventing excessive accumulation of these amino acids.

**\*\*Low-protein foods\*\***: Since high levels of certain amino acids are harmful to infants with these disorders, a low-protein diet is typically recommended. This approach limits the intake of natural proteins that contain high amounts of leucine, isoleucine, and valine, thus helping to manage the levels of these amino acids in the body.

**\*\*High-protein foods\*\***: This is the option that is *\*not\** recommended for infants with ketosis due to metabolic disorders like MSUD. High-protein foods would contribute to an increased intake of leucine, isoleucine, and valine, exacerbating the risk of toxic buildup and severe metabolic crises. Therefore, contrary to the needs of typical infant nutrition, high-protein foods must be avoided in these specific medical conditions.

The diet therapy for infants with conditions leading to ketosis, such as MSUD, is typically a lifelong requirement. It is designed to avoid acute health crises like acidosis and ensure normal physical and

mental development. The psychosocial development of the infant also significantly depends on how effectively and sensitively the diet is managed and administered, considering the social and emotional aspects of food in family and social settings. In summary, while it is essential to control the intake of specific amino acids in infants with ketosis due to metabolic disorders, it is equally crucial to ensure a balanced intake of other nutrients to support overall growth and development. High-protein foods are not suitable for such conditions and should be avoided.

## Question: 5

To prevent food poisoning, all of the following should be done except:

- A. keep kitchen and equipment thoroughly clean
- B. wash hands after using the bathroom or blowing the nose
- C. do not wear gloves with any hand wound
- D. cover and store foods to prevent microbes or animals from reaching it

**Answer: C**

Explanation:

The question asks for an action that should NOT be done to prevent food poisoning. To answer this, we need to consider each option and determine which one is incorrect or not recommended in food safety guidelines.

The first option, "keep kitchen and equipment thoroughly clean," is a fundamental practice in preventing food poisoning. By keeping all surfaces and tools clean, you reduce the risk of harmful bacteria and other pathogens contaminating food. This is a recommended practice.

The second option, "do not wear gloves with any hand wound," might seem tricky initially, but it is actually incorrect as per food safety standards. When handling food, especially in professional settings, it is recommended to wear gloves if you have any cuts, wounds, or sores on your hands. This is to prevent any direct contact between your wound and the food, which could lead to contamination. Therefore, the correct practice would be to wear gloves if you have a hand wound, not avoid wearing them.

The third option discusses cooking foods to appropriate temperatures and limiting the time food is kept at temperatures between 40°F and 140°F (known as the danger zone). These practices are critical to preventing foodborne illnesses because many pathogens grow rapidly within this temperature range. Cooking food to the right temperature ensures that harmful bacteria are killed, and keeping food out of the danger zone prevents bacterial growth.

The fourth option, "prevent known carriers from preparing foods," is also a standard food safety practice. Individuals known to carry pathogens that can lead to foodborne diseases should not handle food to avoid spreading those pathogens.

The fifth option, "wash hands after using the bathroom or blowing the nose," is vitally important. Handwashing is one of the most effective ways to prevent the spread of bacteria and viruses that can cause food poisoning.

The final option, "cover and store foods to prevent microbes or animals from reaching it," is another essential safety measure. Properly covering and storing food helps protect it from contamination by microorganisms and pests, thereby reducing the risk of foodborne illness.

Based on this analysis, the action that should NOT be done, as it contradicts food safety guidelines, is "do not wear gloves with any hand wound." Instead, gloves should be worn to prevent contamination from wounds, making this the correct answer to the question.

### Question: 6

The type of research that is based on data collected on a group of subjects at a single time is which of the following?

- A. randomized clinical trial
- B. prospective study
- C. retrospective study
- D. cross-sectional study

**Answer: D**

Explanation:

A cross-sectional study is a type of observational research that analyzes data from a population, or a representative subset, at a specific point in time. Unlike longitudinal studies, which look at data over a period of time to observe changes, cross-sectional studies provide a snapshot at a single moment. This makes them particularly useful for assessing the prevalence of health outcomes or behaviors in a population.

In the context of the question provided, the correct answer is indeed a "cross-sectional study." This is because the question specifies that the research is based on data collected from a group of subjects at a single time. This format is characteristic of cross-sectional studies, which are designed to measure the current state or characteristics of the subjects without manipulating the study environment or attempting to influence the outcome.

Cross-sectional studies are generally quicker and less expensive to conduct than longitudinal studies because they do not require repeated follow-ups. They are particularly valuable in epidemiology and public health for identifying and understanding the relationships between risk factors and health outcomes at a given time.

However, one major limitation of cross-sectional studies is their inability to establish cause-and-effect relationships. Since the data is collected at one point in time, it's challenging to determine whether a factor preceded or resulted from a condition. This contrasts with prospective studies, which follow subjects over time to see how different variables affect future outcomes, and retrospective studies, which look back at historical data to find correlations.

Despite these limitations, cross-sectional studies provide essential descriptive data that can help form hypotheses for more in-depth, follow-up studies. They are a fundamental component of research in fields that require a broad understanding of statistical data at specific points in time, such as sociology, business, and various branches of medicine.

### Question: 7

Which of the following factors would increase iron absorption?

- A. phytic acid

- B. meat protein factor
- C. polyphenols in tea and coffee
- D. excess of other minerals

**Answer: B**

Explanation:

Iron is a crucial mineral that is essential for the production of red blood cells and for delivering oxygen to our body's cells. Iron absorption can be influenced by various dietary components. Understanding what increases or decreases iron absorption can help in managing iron levels effectively, especially for individuals prone to iron deficiency or anemia.

Among the options provided, the "meat protein factor" is known to enhance iron absorption. This factor, also known as the "meat factor," refers to a component present in animal-based foods that promotes the absorption of iron more effectively than iron obtained from plant sources. The meat protein factor helps in converting iron into a form that is easier for the intestine to absorb. This is particularly important for the absorption of non-heme iron—the form of iron predominant in plant-based foods—which is generally less readily absorbed than the heme iron found in animal products. In contrast, other items listed like phytic acid, polyphenols in tea and coffee, and an excess of other minerals, typically interfere with iron absorption. Phytic acid, found in whole grains, seeds, legumes, and some nuts, can bind to iron and other minerals and inhibit their absorption. Similarly, polyphenols, which are abundant in tea, coffee, and certain fruits and vegetables, can also significantly reduce iron absorption by forming non-absorbable complexes with iron. Lastly, an excessive intake of other minerals, such as calcium, can compete with iron for absorption, leading to reduced iron uptake. Therefore, when considering dietary choices to enhance iron absorption, inclusion of sources containing the meat protein factor can be beneficial, particularly for individuals who might be at risk of iron deficiency. This includes consuming meats like beef, chicken, and fish. For vegetarians or those who prefer plant-based diets, it is important to consider strategies to mitigate the effects of iron absorption inhibitors like phytic acid and polyphenols, such as consuming vitamin C-rich foods alongside plant-based iron sources to enhance iron uptake.

### Question: 8

Any chemical that is soluble in the oral cavity water medium (saliva, mucus) can stimulate taste - perceptual qualities of all of the following through activating taste receptor cells except?

- A. sweet
- B. salty
- C. sour
- D. glutamate

**Answer: D**

Explanation:

The question asks which of the listed taste qualities is not directly stimulated by any chemical soluble in the oral cavity water medium (saliva, mucus) that activates taste receptor cells. The options provided are sweet, salty, sour, and glutamate.

The five basic tastes recognized by human taste receptors are sweet, salty, sour, bitter, and umami. Each of these tastes is detected by specific receptors in the taste buds located on the tongue. Sweet taste is typically elicited by sugars like glucose and fructose. Salty taste is primarily due to the presence of ions such as sodium or potassium. Sour taste is caused by acids, which contain a high concentration of hydrogen ions. Bitter taste can be triggered by a variety of complex organic compounds. Lastly, umami, recognized as a savory or meaty taste, is primarily triggered by glutamate and certain nucleotides. The question's reference to "glutamate" specifically corresponds to the umami taste. Glutamate, an amino acid, is naturally present in many foods and is also added to foods in the form of monosodium glutamate (MSG), enhancing flavor by providing the umami taste.

Given the information in the question and the nature of the taste receptor system, all the listed options—sweet, salty, sour, and glutamate (umami)—are indeed taste qualities that can be stimulated by chemicals soluble in saliva and mucus. Therefore, none of the options provided in the question would be correct as an exception. Each option corresponds to a basic taste category that has specific receptors in the oral cavity activated by soluble chemicals. Thus, the question might be incorrectly framed or missing the correct context for selecting an exceptional case among the provided options.

### Question: 9

Various parts of the chickweed plant are used for:

- A. mucus buildup in the lungs
- B. lowering blood lipids
- C. bronchitis
- D. all of the above

**Answer: D**

Explanation:

Chickweed, scientifically known as *Stellaria media* and commonly referred to as starweed, is a versatile plant widely recognized for its medicinal properties. This herb has been traditionally used in various forms such as teas, ointments, and salads to address a range of health issues.

One of the primary uses of chickweed is for alleviating mucus buildup in the lungs. It acts as an expectorant, helping to loosen phlegm and ease the expulsion of mucus, which makes it beneficial for those suffering from respiratory conditions such as bronchitis. Its soothing properties help in reducing irritation in the respiratory tract.

In addition to respiratory benefits, chickweed is reputed to be effective in treating circulatory problems. It is believed to enhance blood flow and potentially lower blood lipids, thereby contributing to better heart health. Its anti-inflammatory properties also make chickweed a useful remedy for colds and coughs, providing natural relief from symptoms.

Chickweed is also celebrated for its applications in skin care. It is used to treat various skin diseases including rashes and eczema, and its antiviral properties are utilized in removing warts. The plant contains compounds that may help soothe the skin and reduce inflammation.

Beyond its medicinal benefits, chickweed is known to be a good source of vitamin C and other vital nutrients, which contribute to overall health and wellness. Its inclusion in diets not only boosts nutrient intake but also supports immune function.



Given its wide range of uses, chickweed is a valuable plant in the realm of herbal medicine. It addresses multiple health issues, from respiratory and circulatory problems to skin ailments and nutritional deficiencies, making the answer to the question about its uses clearly "all of the above."

### Question: 10

Although clinical evidence of thiamine deficiency is very uncommon in most U.S. populations it is probably an important cause of morbidity in:

- A. infants
- B. alcoholics
- C. elderly
- D. none of the above

**Answer: B**

Explanation:

The question is asking about the likelihood of thiamine deficiency in specific populations within the U.S. Despite thiamine deficiency being rare in the general population, it is more prevalent in certain groups. The correct answer among the options provided is "alcoholics."

Thiamine, also known as Vitamin B1, is essential for glucose metabolism and plays a critical role in nerve, muscle, and heart function. Thiamine deficiency can lead to serious health problems, including beriberi and Wernicke-Korsakoff syndrome, which are particularly common among people with chronic alcoholism. Alcoholics are at higher risk of thiamine deficiency for several reasons: 1. Poor dietary intake: Alcoholics may consume a diet low in nutritious foods that supply thiamine. 2. Impaired absorption: Chronic alcohol consumption can damage the lining of the gastrointestinal tract, which impairs the body's ability to absorb thiamine and other nutrients. 3. Increased excretion: Alcohol increases the excretion of thiamine through the kidneys.

The usual method for testing thiamine levels involves measuring thiamine excretion in urine. Typically, this is done using 'spot samples'—single urine samples collected at a specific point in time, either in a clinical setting or in the field. This method is more practical than collecting urine over a 24-hour period. However, it has significant limitations. The thiamine content in spot urine samples can vary greatly even within the same individual, depending on various factors such as hydration status and recent dietary intake. This variability makes the test relatively insensitive and not always reliable for assessing an individual's nutritional status accurately.

Given these limitations, testing for thiamine deficiency in populations at higher risk, like alcoholics, can be challenging. Health care providers may need to consider multiple factors or use additional methods to assess thiamine levels effectively. Despite these challenges, recognizing and addressing thiamine deficiency in high-risk groups remains crucial due to the serious health issues associated with this condition.

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