請閱讀以下文章，並回答 1-50 的問題，所有問題皆為單選題，每題 2 分，答錯倒扣 0.5 分，請於試卷上「選擇題作答區」內依序作答

Article 1

Humanizing food may help reduce food waste

(Source: IFTNEXT, November 13, 2019, https://www.ift.org/iftnext/2019/november/humanizing-food-may-help-reduce-food-waste)

Researchers are working to find ways to reduce the staggering amounts of wasted food, and one of the latest studies on the topic suggests that thinking of fresh produce in terms of human traits may help. Here is a shameful statistic: A little more than 1 billion tons of food is wasted every year around the world. Researchers are working to find ways to reduce the staggering amounts of wasted food, and one of the latest studies on the topic suggests that thinking of fresh produce in terms of human traits may help. This humanizing of food may help people look at fruits and vegetables that are a little less than fresh or imperfect in a different way. "We suggest that when old produce is humanized, it is evaluated more favorably, since it leads consumers to evaluate the old product with a more compassionate lens," write the researchers, who are from the University of Illinois at Urbana-Champaign and University of Houston. A couple of the ways that the researchers anthropomorphized produce that was slightly past its prime in images was to show a banana lounging in a chaise and arranging cucumber slices in a way to show a human face. Subjects rated these types of images more favorably than images of produce that was not anthropomorphized.

The researchers suggest that store managers and food marketers could adopt a similar format to showcase produce that may look less than perfect but is otherwise nutritious and safe. They published their study in Journal of the Association for Consumer Research.

1. What is the theme of this article? (1) a food fraud report (2) a food advertisement (3) a consumer behavior report (4) a food safety report.
2. The word 'anthropomorphize' in the article is closest in meaning to (1) attributes (2) strength (3) speed (4) imagination of human.
3. According to this article, which of the following can alter the selection of consumers? (1) colorful packages (2) human traits (3) emphasized freshness (4) traceability of products.
4. What types of food are referred in this article? (1) fast food (2) poultry (3) dairy (4) fruits and vegetables.

見背面

5. According to this article, all of the statements are true of wasted food EXCEPT: (1) It is safe. (2) It is less nutritious. (3) It is imperfect. (4) It is less fresh.

Article 2

Students engineer honey using bacterium, not bees

(Source: IFTNEXT, December 2, 2019, https://www.ift.org/iftnext/2019/december/students-engineer-honey-using-bacterium-not-bees)

A team of 12 students from the Department of Biotechnology and Food Engineering at the Technion – Israel Institute of Technology has won a gold medal at the International Genetically Engineered Machine (iGEM) competition in Boston for its bee-free honey. The synthetic honey is produced by the bacterium *Bacillus subtilis*, which "learns" to produce honey following reprogramming in the lab. In addition to alleviating some of the pressure on declining bee populations, the artificial honey enables manufacturers to formulate the end product to the desired specifications, including taste.

Twelve students from six different disciplines—biomedical engineering, medicine, biotechnology and food engineering, industrial management and engineering, chemical engineering, and aerospace engineering—came together for the project, which they named BeeFree. "Our vision is to create a sustainable BeeFree honey using engineered bacteria, which will process a nectar-like solution using secreted enzymes that mimic the honey stomach environment," the team states on its website.

Honeybees produce honey to make the flower's nectar more digestible and well-preserved, using various enzymes secreted in their stomachs. To replicate this process, the team established a comprehensive model of the entire "Synthetic Honey Stomach" metabolic pathway. They used *B. subtilis* as a bacterial model for protein secretion because its high secretion capacity made it a prime candidate to produce the target enzymes and create the artificial honey.

iGEM is a competition established in 2004 by the Massachusetts Institute of Technology (MIT), which gives students the opportunity to study and experiment with all aspects of scientific and applied research in synthetic biology. Some 300 teams from universities all over the world took part in the competition. According to iGEM, gold medals are not grand prizes; they are awarded for recognition of excellence. A total of 163 gold medals were handed out during the competition, as well as 77 silver medals, and 57 bronze medals.

6. What is the theme of this article? (1) a food fraud report (2) a food advertisement (3) a competition award report (4) a food safety report.

接次頁

7. The word 'alleviate' in the article is closest in meaning to (1) accelerate (2) accurate (3) aggravate (4) moderate.
8. According to this article, all of the statements are true of BeeFree honey EXCEPT: (1) a natural nectar solution (2) a product from Synthetic Honey Stomach (3) a conversion product from bacterial enzymes (4) an artificial honey.
9. According to this article, why *Bacillus subtilis* was selected for this process? (1) It is a major bacterium in the honeybee's stomach. (2) It is the assigned species by iGEM. (3) It produces great quantities of proteins. (4) It is a natural source of targeted enzymes.
10. Which organization started the iGEM competition? (1) Israel Institute of Technology (2) Massachusetts Institute of Technology (3) Technion College (4) Boston University.

Article 3

Neuroprotective Effects of Bioavailable Polyphenol-Derived Metabolites against Oxidative Stress-Induced Cytotoxicity in Human Neuroblastoma SH-SY5Y Cells

(Source: *J. Agric. Food Chem.* 2017, 65, 4, 752-758)

Abstract

Oxidative stress is involved in cell death in neurodegenerative diseases. Dietary polyphenols can exert health benefits, but their direct effects on neuronal cells are debatable because most phenolics are metabolized and do not reach the brain as they occur in the dietary sources. Herein, we evaluate the effects of a panel of bioavailable polyphenols and derived metabolites at physiologically relevant conditions against H_2O_2-induced apoptosis in human neuroblastoma SH-SY5Y cells. Among the 19 metabolites tested, 3,4-dihydroxyphenylpropionic acid, 3,4-dihydroxyphenylacetic acid, gallic acid, ellagic acid, and urolithins prevented neuronal apoptosis via attenuation of ROS levels, increased REDOX activity, and decreased oxidative stress-induced apoptosis by preventing the caspase-3 activation via the mitochondrial apoptotic pathway in SH-SY5Y cells. This suggests that dietary sources containing the polyphenol precursors of these molecules such as cocoa, berries, walnuts, and tea could be potential functional foods to reduce oxidative stress associated with the onset and progress of neurodegenerative diseases.

11. What is the main purpose of this research? (1) To understand the neuroprotective effects of polyphenol-derived metabolites. (2) To evaluate the neuroprotective effects of polyphenol. (3) To evaluate the anti-inflammatory activity of polyphenol-derived metabolites. (4) To investigate the antiproliferative activity of polyphenol-derived metabolites.

見背面

12. What's the meaning of apoptosis? (1) programmed cell death (2) programmed cell growth (3) cell cycle (4) programmed cell metastasis
13. What is "REDOX" activity in this article? (1) oxidation-reduction (2) DNA replication (3) DNA repair (4) RNA transcription
14. Which of the following cells is used in this study? (1) macrophage cells (2) hepatoma cells (3) leukemia cells (4) neuroblastoma cells
15. According to this article, which of the following play an important role of polyphenol-derived metabolites in the neuroprotective effects (1) reduce oxidative stress (2) increase oxidative stress (3) induce apoptosis (4) induce caspase-3 activation

Article 4

Dietary fiber isolated from sweet potato residues promotes a healthy gut microbiome profile

(Source: Food & Function, 2020, DOI: 10.1039/c9fo01009b)

This study investigated the impact of dietary fiber from sweet potato residue (SPDF) on the diversity of the gut microbiota. An *in vitro* batch culture system simulating the human gut was used to understand the prebiotic role of SPDF. The results showed that SPDF mediated a significant increase in the concentrations of *Bifidobacterium* and *Lactobacillus*, whereas induced a significant decrease of *Enterobacillus*, *Clostridium perfringens* and *Bacteroides*. The prebiotic index and *Bifidobacterium*/*Enterobacillus* value were also significantly increased in SPDF groups compared to those of the control group, suggesting that SPDF had prebiotic effects. Furthermore, to investigate the effects of SPDF on the intestinal microecosystem, diets containing different concentrations of SPDF were used to feed Wistar rats for 4 weeks. 16S rRNA gene sequencing, short chain fatty acid quantification and physiochemical property analysis in the rat feces were then conducted. The results showed that SPDF significantly increased the *Bacteroidetes* to *Firmicutes* ratio at the phylum level and the amount of *Akkermansia* was also increased at the genus level, which was confirmed by qRT-PCR. The production of propionate and butyrate in the rat feces of both 3% and 15% SPDF groups was higher than that in the control group, which was further confirmed by the decrease of pH. Additionally, SPDF supplementation in this study resulted in a higher villus height to fossa depth ratio, which indicated improved digestion and absorption in the GI tract. Our findings support the utilization of SPDF from sweet potato residue in the development of potentially prebiotic food products for improving intestinal health.

16. What is the main purpose of this research? (1) To investigate the effects of sweet potato dietary fiber on the gut microbiota (2) To evaluate the relationships between

接次頁

polyphenol and gut microbiota. (3) To evaluate the relationships between phytochemicals and gut microbiota. (4) To explore the relationships between probiotics and gut microbiota.

17. According to the article, which of the following **is not** the short chain fatty acid? (1) acetic acid (2) propionic acid (3)butyric acid (4) glutamic acid
18. The bacterial composition at phylum levels was determined by (1) Western bolt (2) Southern blot (3) Northern blot (4) qPCR
19. Which of the following bacteria was increased at the genus level? (1) *Enterobacillus* (2) *Firmicutes* (3) *Akkermansia* (4) *Bacteroids*
20. According to the article, which sample was used for detecting 16S rRNA (1) mouse blood (2) rat feces (3) mouse feces (4) rat urine

Article 5

Source: PNAS (2019) 116: 23357–23362

Abstract

Food choices are shifting globally in ways that are negatively affecting both human health and the environment. Here we consider how consuming an additional serving per day of each of 15 foods is associated with 5 health outcomes in adults and 5 aspects of agriculturally driven environmental degradation. We find that while there is substantial variation in the health outcomes of different foods, foods associated with a larger reduction in disease risk for one health outcome are often associated with larger reductions in disease risk for other health outcomes. Likewise, foods with lower impacts on one metric of environmental harm tend to have lower impacts on others. Additionally, of the foods associated with improved health (whole grain cereals, fruits, vegetables, legumes, nuts, olive oil, and fish), all except fish have among the lowest environmental impacts, and fish has markedly lower impacts than red meats and processed meats. Foods associated with the largest negative environmental impacts—unprocessed and processed red meat—are consistently associated with the largest increases in disease risk. Thus, dietary transitions toward greater consumption of healthier foods would generally improve environmental sustainability, although processed foods high in sugars harm health but can have relatively low environmental impacts. These findings could help consumers, policy makers, and food companies to better understand the multiple health and environmental implications of food choices.

Introduction

Dietary choices—the types and amounts of foods that individuals consume—are a major determinant of human health and environmental sustainability. Nine of the top 15 risk factors for global morbidity result from poor dietary quality, while diseases

見背面

associated with poor dietary quality, including coronary heart disease (CHD), type II diabetes, stroke, and colorectal cancers, account for nearly 40% of global mortality (1, 2). Furthermore, agricultural food production emits ~30% of global greenhouse gasses (GHGs) (3, 4); occupies ~40% of Earth's land (5); causes nutrient pollution that profoundly alters ecosystems and water quality (6); and accounts for ~70% of Earth's freshwater withdrawals from rivers, reservoirs, and ground water (7), among other negative environmental effects (8, 9). Here we examine the potentially complex and multifaceted food-dependent linkages between and among 5 different diet dependent health outcomes in adults—type II diabetes, stroke, coronary heart disease, colorectal cancer, and mortality—and 5 different environmental impacts of producing the foods. Such information could help consumers, food corporations, and policy makers make better decisions about food choices, food products, and food policies, potentially increasing the likelihood of meeting international sustainability targets such as the United Nations' Sustainable Development Goals or the Paris Climate Agreement (10, 11). Previous analyses have examined the overall health and environmental impacts of dietary patterns (e.g., refs. 12 and 13), but have not decomposed these multifaceted impacts to individual foods at quantities consumed on a daily basis. Moreover, analyses looking at individual foods commonly examine the health (e.g., ref. 14) or environmental impacts (e.g., ref. 15) in isolation of the other.

In particular, we explore the multiple human health and environmental impacts of 15 different food groups: chicken, dairy, eggs, fish, fruits, legumes, nuts, olive oil (which we include as an indicator for vegetable oils high in unsaturated fatty acids because of data availability; see the discussion in SI Appendix), potatoes, processed red meat, refined grain cereals, sugar-sweetened beverages (SSBs), unprocessed red meat, vegetables, and whole grain cereals. Our analysis includes the 5 health outcomes mentioned above and 5 environmental outcomes—GHG emissions, land use, scarcity-weighted water use (water use multiplied by a constant that scales regionally based on water availability after demand from humans and aquatic ecosystems has been met) (16), and 2 forms of nutrient pollution—acidification and eutrophication. We first consider the health and environmental impacts of these foods separately, and then explore them jointly

Please choose the best answer according to the above article

21. What is morbidity? (1) state of being subject to death. (2) number of deaths in a given area or period, or from a particular cause. (3) condition of being diseased (4) number of newly diagnosed cases of a disease.
22. According to the article, which kind of the foods is associated improved health, but have relatively higher negative environmental impacts? (1) fruits (2) vegetables (3)

接次頁

processed red meat (4) fish

23. According to the article, which kind of the foods is associated high disease risk, but low environmental impacts? (1) sugar-sweetened beverage (2) unprocessed red meat (3) Olive oil (4) processed red meet
24. What is eutrophication? (1) acidification of land (2)non-development area (3) excessive richness of nutrients in water (4) contaminated water
25. Which gas is not "greenhouse gas"? (1) CO_2 (2) CH_4 (3) H_2Og (4) O_2

Article 6

Source: Current Opinion in Biotechnology (2018) 49: 148–155

Abstract

Yeasts have been used for food and beverage fermentations for thousands of years. Today, numerous different strains are available for each specific fermentation process. However, the nature and extent of the phenotypic and genetic diversity and specific adaptations to industrial niches have only begun to be elucidated recently. In *Saccharomyces*, domestication is most pronounced in beer strains, likely because they continuously live in their industrial niche, allowing only limited genetic admixture with wild stocks and minimal contact with natural environments. As a result, beer yeast genomes show complex patterns of domestication and divergence, making both ale (*S. cerevisiae*) and lager (*S. pastorianus*) producing strains ideal models to study domestication and, more generally, genetic mechanisms underlying swift adaptation to new niches.

Introduction

'Domestication' is a term that refers to artificial selection and breeding of wild species to obtain cultivated variants with enhanced desirable features that thrive in man-made environments, often at the cost of suboptimal fitness in natural settings. Several genotypic and phenotypic signatures of domestication have been described in crops, livestock and pets. These include genome decay, polyploidy, chromosomal rearrangements, gene amplifications and deletions, horizontal gene transfer and loss of genetic diversity due to bottlenecking [1,2]. Interestingly, similar phenomena are also observed in various microbial species, both prokaryotic and eukaryotic, that are linked to human food production. Perhaps the most well studied model is the common brewer's and baker's yeast, *Saccharomyces cerevisiae*, which is the main driver in many industrial fermentations. However, studies focusing on the evolution of industrial *Saccharomyces* strains often use the terms 'adaptive evolution' or 'domestication' too freely. For example, both terms are commonly used to explain phenotypic divergence from wild ancestors, overlooking alternative explanations such as random genetic drift

見背面

[3]. Only recently, more elaborate studies have reported clear genome-wide signatures of domestication as well as convergent evolution of industrially relevant traitsin separate lineages. These observations provide conclusive evidence that industrial yeast diversity is not solely shaped by genetic drift caused by bottlenecking and small isolated populations, but also as a result of selection and niche adaptation. In wine yeasts for example, adaptive horizontal gene transfer events [4,5,6] and copy number variations [7,8,9,10] have been described that increase sugar and nitrogen metabolic activity, conferring competitive advantages during grape must fermentation and providing better tolerance to chemicals used in vineyards (e.g. copper sulphate) and in wine [11] (e.g. sulphite) (For a review see [7]). Interestingly however, the strongest genetic and phenotypic signatures of domestication are found in yeasts used for beer production. Several distinctive features make traditional beer production an ideal setting for microbial domestication. Firstly, beer yeasts are harvested and re-used after the fermentation process to initiate the next fermentation batch, a process called 'backslopping'. This continuous growth in a very specific industrial niche has resulted in continuous selection imposed by the brewing environment. Secondly, beer is produced year-round, causing a near-complete isolation from wild isolates. In contrast, wine is seasonal and wine yeasts spend most of the year in and around the vineyards or in the guts of insects, where nutrient limitation can trigger sexual cycles and hybridization with wild yeasts [12]. Therefore, present-day beer yeasts can be considered the result of a centuries-long evolution experiment in a highly selective niche. In this review, we will highlight new insights into beer yeast evolution and domestication. We will discuss *S. cerevisiae* and *S. pastorianus*, both involved in production of specific beer types, which underwent a different route to domestication

26. What is the meaning of "domesticated yeast"? (1) yeast from natural environment (2) genetic-modified yeast (3) yeast is grown in nutrient deficient environment (4) yeast is grown in an artificial selection and breeding of wild species
27. What is the meaning of "backslopping" fermentation? (1) a portion of beer yeasts culture are re-used in next fermentation batch (2) pure yeast starter is added to an old batch of fermentation (3) a spontaneous culture (4) an inhibitor is added to fermentation culture to stop the fermentation.
28. What is the difference between ale and lager strains? (1) both of the yeast strains are *S. cerevisiae* (2) both of them are *S. pastorianus* (3) both of them are hybrid strains (4) only lager strains are hybrid strains.
29. What is the reason that causes the change of the beer yeast (1) genetic stable (2) pure culture technique (3) brewing environment (4) slow growth rate.
30. Which is NOT correct answer in regards to wine yeast description? (1) wine yeast

接次頁

has more striking adaptation than beer yeast (2) wine yeast has higher sugar metabolic activity compared to beer yeast (3) wine yeast has higher nitrogen metabolic activity compared to beer yeast (4) wine yeast can tolerate higher concentration of copper sulphate compared to beer yeast.

Article 7

(Source: *Food Chemistry*, 2019278:144-162)

Food fingerprints can be defined as molecular markers that represent a characteristic food state or condition, allowing more effective product discrimination. Essentially, it is a marker or set of markers that allow us to answer many questions about food authenticity, as "Are those organic carrots truly organic? Does this saffron really originate from Spain? Can we discriminate between orange juice and pulp wash? Unfortunately, the search for these fingerprints is not only related with the quality of the products, but also with their safety to human health. Although the deliberate adulteration of food and beverages to deceive consumers is illegal in any part of the world, the promise of fast economical incomes is becoming very prevalent and affects a broad range of products, from dietary food products to beverages. Food products adulteration is carried out to increase volume and weight, mask inferior quality and replace authentic substances with cheaper ones, with benefits for sellers and possible harms to consumers. It is therefore a major concern for consumers, food producers, companies, and regulatory agencies. The food frauds most often detected are adulteration (e.g., addition of water), sophistication processes (e.g., use of sugars, additives, or flavours), and counterfeiting (e.g., use of prohibited additives and colorants, incorrect botanical and geographical declarations, reuse of expired products, or incorrectly naming something an organic product). Therefore, when there is a food suspected of adulteration, rapid and robust methods, as well as specific and reliable markers, must be available to support the withdraw of such products from the food chain and act against the facilitators of that frauds. This is particularly relevant when, besides the economic loss, the adulteration involves health risks for the consumers. Hence, the ability to trace and authenticate food products is a great concern for the food industry, but also for the public authorities. For this reason, there is extensive legislation regarding food safety and authenticity all over the world, being USA and EU responsible for the most comprehensive and strict guidelines. In USA, the Food Safety Modernization Act (FSMA) defined by the Food and Drug Administration (FDA) establishes several rules to prevent foodstuffs adulteration. In turn, the European Food Safety Authority (EFSA) includes a set of laws and guidelines for the food quality and safety assurance, designed as General Food Laws.

見背面

In food authentication field, there are targeted and untargeted methods of analysis. The first approach focuses on the analysis of a specific metabolite or group of metabolites, while in the untargeted approach, the major goal is discrimination of patterns of metabolites that may change in response to environmental, genetic or human alterations (adulteration). In this context, application of metabolomics to food science for assessing safety and authenticity has gained much interest. Metabolomics studies are mainly discriminative and predictive, aiming to find differences between samples (e.g., for the oranges origin discrimination, for the variety and vintage differentiation of wines or for the civet coffees authentication) and to create statistical models to predict class memberships (e.g., for the classification of green coffee beans or wines according to botanical and geographical origins). Food fingerprints may be obtained for food quality, safety and authenticity purposes. To achieve this, an experimental design should be carefully established, being the sample preparation and the analytical platforms selected critical parameters to evaluate. A wide range of instrumental techniques, as chromatography (gas and liquid), mass spectrometry or spectroscopy is used to monitor food authenticity and safety. To support this review, it was queried PubMed and Scopus databases with the keywords "biomarkers" and "food authentication" to obtain the research published in the last five years in food authenticity. This has retrieved us hundreds of reports, essentially involving mass spectrometry (MS)-based studies (mainly gas chromatography coupled with mass spectrometry (GC–MS) and liquid chromatography mass spectrometry with quadrupole time of flight technology (LC-q-TOF-MS)), spectroscopy (nuclear magnetic resonance (NMR), Raman, UV–Visible, etc.) and spectrofluorimetry methods. Nevertheless, more than 75% of the publications were performed by MS technology. The popularity of MS approaches is due to ability to distinguish small differences between samples in complex matrices. In contrast, the development of spectroscopy and spectrofluorimetry methods may be related with their non-destructive nature, which is very relevant for expensive samples. Other analytical strategies, as stable isotope and DNA analyses are being also applied routinely for food authenticity purposes. We will focus mainly on studies involving small molecules (<1200 Da) identified by chromatographic methodologies and labelled as biomarkers given their ability to discriminate different samples. Moreover, we will only consider metabolites certified through robust statistical models. Hence, the main objective of this work is to assign high significant biomarkers to food authenticity and safety monitoring according to their geographical and botanical origin, genetic diversity, production systems, adulteration and spoilage or freshness indication. This practical guide will allow an easy search of metabolites, contributing to eventually identify new molecular routes for food authentication and safety assessment, fostering the improvement of the current regulatory frameworks.

接次頁

31. What is food fingerprints? (1) A chemical profile of metabolites by food (2) a physical impression by food appearance (3) legislation for food safety (4) a forensic marker.
32. Which one could be an application using "food fingerprints"? (1) to deliberate adulteration (2) to monitor the foodstuff's authentication (3) to promote the sophistication processes (4) to counterfeiting the quality.
33. What is food fraud? (1) an unintentional process (2) a safety issue (3) an economic issue (4) a detection technology.
34. Which one is an issue about food authenticity? (1) adulteration of illegal chemicals (2) residue of pesticide (3) poor quality of food (4) geographical origin.
35. Which of the following description about FSMA is **WRONG**? (1) legislation to prevent food fraud (2) proposed by FDA (3) conflict to EFSA (4) signed by President Obama.
36. Which the following analyte is **NOT** the targeted analysis? (1) residue of pesticide (2) pattern of metabolites (3) quality of nutrients (4) content of food additive.
37. Which of the following description about Metabolomic study is **WRONG**? (A) a targeted analysis (B) employ statistical models to predict the origin (C) find out the differences between samples (D) for assessing food safety and authenticity.
38. To achieve food fingerprint, which technology may futile? (A) mass spectrometry (B) electrochemistry (C) spectrofluorimetry (D) spectroscopy.
39. Why mass spectrometry is a universal technology for food authenticity? (A) it is a non-destructive method (B) it is an expensive tool (C) it could overcome the matrix effect (D) it could detect DNA.
40. Which one is **NOT** the purpose of the metabolomic study? (A) indicator for spoilage or freshness (B) origin of geographical and botanical (C) investigate the gene diversity (D) assess the DNA sequence.

Article 8

To treat or not to treat Alzheimer's disease by the ketogenic diet? That is the question

(Source: Neural regeneration research, January 15, 2020)

Alzheimer's disease (AD) and current treatments: AD is a serious neurological disorder worldwide that affects about 26 million people, and whose prevalence has been calculated to quadruple by 2050, thus reaching over 1% of the total population, with the highest prevalence occurring in both adults and elderly. Neurodegenerative processes of the sporadic form of AD probably start 20 years before the clinical onset of the disorder. This disease is the most important cause of dementia in world aged

見背面

society (~75%). AD is a disorder that affects not only patients but also their caregivers. The social and economic burden associated with AD was calculated as an example in the United States alone; 600 billion dollars annually is spent on caring for AD patients. AD is the one of the great health-care challenges of the 21st century. The incidence of AD, a chronic and progressive neurodegenerative disorder, is increasing, as well as the need for efficient methods of diagnosis, prevention and treatment. The characteristic clinical and neuropathological hallmarks of AD are: dementia as the main clinical symptom and in post-mortem neuropathological examination, the presence of amyloid plaques as well as neurofibrillary tangles and loss of neurons in the brain of AD patients. The role of amyloid and tau protein is questioned in the etiology of AD and other causes such as ischemic etiology are being considered. There are several treatments that are not causal but symptomatic that are not effective, especially for advanced disease. To date, only a few drugs are approved, such as acetylcholinesterase inhibitors and memantine. Drugs that regulate partly the activity of neurotransmitters and partly alleviate behavioral symptoms. Other treatment options include active and passive immunization, anti-aggregation specifics, and secretase inhibitors. The road to clarity AD etiology, early final ante mortem diagnosis and treatment has been one fraught with a wide range of complications and numerous revisions with a lack of a final solution. Research has recently been launched to identify new mechanisms underlying AD that could be the target of new prevention strategies. Therefore, other treatment options can be recommended, and the ketogenic diet seems to be an interesting last resort solution at the moment. The diet contains large amounts of fat and low carbohydrates with vitamin supplementation. New scientific articles suggest that a low-carbohydrate and high-fat ketogenic diet may help alleviate the brain damage in AD. A ketogenic diet can alleviate the effects of impaired glucose metabolism in AD by providing ketones as an additional source of energy. Here, based on new data, we have presented that a ketogenic diet can be effective in preventing and treating AD, but both ketone bodies production and carbohydrate reduction are needed to achieve this.

41. In 2050, how many people are estimated to live with AD? (1) 13 million (2) 26 million (3) 52 million (4) 104 million.
42. which of the followings probably would not be found in the brain of AD patients (1) loss of neurons (2) amyloid deposit (3) lipid accumulation (4) neurofibrillary tangles.
43. According to this article, which of the followings might be the risk population of AD? (1) smoking people (2) housewives (3) people with a sedentary lifestyle (4) grown-up
44. How much money per month is spent on taking care of AD patients in the USA? (1)

接次頁

10 billion (2) 50 billion (3) 100 billion (4) 600 billion.

45. Etiology of AD is to study (1) the cause of AD (2) the symptom of AD (3) the prevalence of AD (4) the mortality of AD
46. Which of the following statements is not true? (1) the most important cause of dementia is AD (2) sporadic form of AD is not the major form of AD (3) AD affects both the patients and their caregivers (4) AD brings challenges to health care.
47. The word "alleviate" can be replaced by which of the followings (1) ameliorate evoke (2) overcome (3) (4) elicit.
48. which of the following might not be the cause of AD? (1) Amyloid (2) tau protein (3) ketones (4) lack of oxygen.
49. which of the followings has not yet adopted to treat AD (1) memantine (2) passive immunization (3) secretase inhibitor (4) early final ante mortem diagnosis
50. According to this article, which of the followings is not true for ketogenic diet (1) is a kind of high-fat and low-carbohydrate diet (2) is considered as a potential savior for AD (3) would cause ischemic etiology of AD (4) can improve the impaired glucose metabolism in AD.

試題隨卷繳回