

單選題共計 100 分，每題 2 分，答錯倒扣 0.5 分
*注意：請於試卷上「選擇題作答區」內依序作答

Reading test article 1 (source: J Food Drug Anal 2014, 22:391-398.)

In order to guarantee the safety of chocolate ice cream production, HACCP system is applied to the production process. The biological, chemical and physical hazards that may exist in every step of the chocolate ice cream production were identified and then critical control points were selected, as well as establishing critical limits, monitoring, corrective measures, records and verifications. The critical control points were identified including pasteurization and freezing. Implementing HACCP system in food manufacturing can effectively assure food safety and quality, expand the market, and improve manufacturers' management level.

The hazards in chocolate ice cream production are mainly due to excessive food additives, inappropriate processing conditions and unsanitary manufacturing environment. The results of this study show the extent of the positive effects that a Hazard Analysis Critical Control Points (HACCP) system, introduced in and chocolate ice cream factory, had on both the microbiological quality of the final product and on the total quality/hygiene management as well. The application of HACCP system provides food manufacturers effective preventive methods to guarantee food safety and improve management. Additionally, the documentation and record in HACCP system can easily help tracing the origin of contamination, thus prevent the further production of unqualified products and lower the consumption of manpower, material and financial resources. At present, HACCP is difficult to implement in some manufacturers due to technical and financial obstacle. Although most of the major manufacturers have applied HACCP for ice cream production, the problems come from the point of sale. For instance, the retailers in night market, which is a special Taiwanese culture, may lack of enough knowledge of hygiene resulting in the contamination of the ice cream. Therefore, it requires government's support for its wider application. Further linkage of the HACCP system introduced in the factory to quality management systems, such as ISO regulation, can be possibly proved to provide higher quality/hygiene standards, along with higher awareness of the factories customers (i.e. ice cream retailers).

1. What is the study target in this article? (A) chocolate ice cream, (B) peanut butter ice cream, (C) chocolate butter, (D) I have no idea.
2. What's the full name of HACCP? (A) Haha, CC, and please, (B) Hazard Analysis Critical Control Points, (C) Holiday Analysis Critical Control Points, (D) Hazard Analysis Critical Cooling Points.

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3. Why do we apply HACCP for ice cream production? (A) cheaper price, (B) manufacturer's profit, (C) guarantee the safety of chocolate ice cream, (D) my mom likes it.
4. What type of hazard may exist during ice cream production? (A) biological, (B) chemical, (C) physical, (D) all of the above.
5. What's the critical control points identified in this study? (A) pasteurization, (B) freezing, (C) pasteurization and freezing, (D) storage.
6. How does HACCP system help food manufacturer? (A) effective preventive methods to guarantee food safety, (B) improve management, (C) secure consumers' health, (D) all of the above.
7. What is the special Taiwanese culture mentioned in this article? (A) beautiful lady, (B) handsome boy, (C) the retailers in night market, (D) Chinese culture.
8. What regulation should be connected to HACCP system in the future? (A) chocolate ice cream, (B) ISO, (C) Taiwanese government, (D) GMP.
9. What is the advantage for implementing HACCP system in food manufacturing? (A) assure food safety and quality, (B) expand the market, (C) improve manufacturers' management level, (D) all of the above.

Reading test article 2 (source: Cellulose 2014, 21(1):835-844)

Cellulose, a β -1, 4 linkage polysaccharide, which is the most abundant material on earth (Brown 2004), can be acquired from plants, microorganisms (Ohad et al. 1962), and animals (Sturcova et al. 2005). Although plant cellulose (PC) and bacterial cellulose (BC) possess the same molecular structure, BC exhibits the unique physical properties at nanoscale network (Yamanaka et al. 1989; Nishi et al. 1990) (i.e. high water content and high tensile strength (Tanpichai et al. 2012)), and does not require extra processing steps to remove impurities such as lignin, pectin, and hemicellulose. Accordingly, BC has been adopted as biomaterials of wound dressing (Portal et al. 2009), low calorie foods (Okiyama et al. 1992), and composite papers (Brown 2004; Cheng et al. 2011; Trovatti et al. 2012).

Many bacteria can produce BC including *Achromobacter*, *Alcaligenes*, *Gluconacetobacter*, *Aerobacter*, *Agrobacterium*, *Azotobacter*, *Pseudomonas*, *Rhizobium*, and *Sarcin* (Brown 2004; Deinema and Zevenhui 1971). However, only *Gluconacetobacter xylinum* (*G. xylinum*) can produce BC at commercially viable level due to its high productivity.

A rotating disk bioreactor with plastic composite support (PCS) as the solid support was evaluated for BC production. Results demonstrated that BC can be produced in a semi-continuous manner. The BC productivity reached around 2.58 mg/cm²/day and can be sustained for at least five consecutive runs. Scanning electron microscopy results confirmed that *Gluconacetobacter* can attach on the PCS surface, which eliminates the need of reinoculation. X-ray diffraction patterns and mechanical analysis of BC produced from this semi-continuous process exhibited lower crystallinity (66.9 %) and mechanical property (Young's modulus of 372.5 MPa) when compared with the BC obtained from static culture (crystallinity= 88.7 %, Young's modulus of 3955.6 MPa). Both BC samples possessed similar water content (98.66% vs. 99.04%) and thermostability (around 346°C). In conclusion, the PCS rotating disk bioreactor system can be used to produce BC in pellicle form with enhanced productivity and, meanwhile, can be scaled up easily to meet commercial need.

10. What's the linkage between cellulose units? (A) β -1, 3 linkage, (B) β -1, 6 linkage, (C) β -1, 4 linkage, (D) α -1, 4 linkage.
11. What does "(Brown 2004)" mean in the article? (A) reviewer, (B) reference, (C) singer, (D) editor.
12. What is the most abundant material on earth? (A) cellulose, (B) soil, (C) water, (D) bacteria.
13. Where can we acquire cellulose? (A) plant, (B) microorganism, (C) animal, (D) all of the above.
14. What does PCS stand for? (A) please cut my sample, (B) plastic composite support, (C) polymerase chain stimulation, (D) popo, child, store.
15. What species of bacteria can produce BC at commercially viable level? (A) *Achromobacter*, (B) *Alcaligenes*, (C) *Gluconacetobacter*, (D) *Pseudomonas*.
16. BC produced from this semi-continuous process exhibited lower crystallinity ((A) 69.6%, (B) 99.6%, (C) 66.6%, (D) 66.9 %) and mechanical property (Young's modulus of 372.5 MPa).

Reading test article 3: Preventing food allergies: Finding the why behind the when (source: <http://blogs.scientificamerican.com/food-matters/2014/04/23/preventing-food-allergies-finding-the-why-behind-the-when/>)

Nearly four out of every 100 children in the U.S. have a food allergy, according to CDC data from 2007.

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Avoiding common food allergens, such as peanuts, eggs, tree nuts and fish, for the first few years of life was the prescription for prevention for many years, but in 2008 the American Academy of Pediatrics reversed these guidelines, noting little evidence existed to say the avoidance was preventing food allergies. Newer expert recommendations have even suggested introducing these foods early could play a role in preventing allergies. An idea known as the “dual-allergen exposure hypothesis,” which has to do with when and how children are exposed to allergens, could be a reason why.

17. Existed evidence (A) strongly supports, (B) weakly supports, (C) entirely rejects, (D) fully supports that the avoidance was preventing food allergies.

Last month, I had the chance to listen to allergy expert Gideon Lack speak on the hypothesis at an allergy panel discussion during the Association of Health Care Journalists (AHCJ) annual conference. The dual-allergen exposure hypothesis is the theory that exposure to food allergens through the skin can lead to allergy, while consumption of these foods at an early age may actually result in tolerance, as Lack explains in a 2012 article. Depending on the balance of these exposures, either tolerance or allergy will “win.” Children with eczema, for example, have a disrupted skin barrier that could allow exposure to food proteins in the environment – such as peanut oil in creams or peanut residue on tables. Under the hypothesis, if these children avoid peanuts but are still exposed to them in the environment, they might be more likely to develop peanut allergy.

18. The word “Dual” in “dual-allergen exposure hypothesis” means: (A) body and soul, (B) head and toe, (C) right and wrong, (D) skin and mouth.

Lack told the audience about two studies that could shed some light on researchers’ understanding of the hypothesis and the development of food allergy. One study is the LEAP Study, which involves a group of children assigned to avoid peanut-based foods until three years old and another group assigned to eat a peanut snack three times a week. The other is the EAT study, which is comparing breast-feeding plus feeding of allergenic foods with breast-feeding alone. However, Lack noted that very few evidence-based recommendations currently exist about when children should start eating allergenic foods, as health reporter Sandra Jordan explains in her blog on the AHCJ panel. With the prevalence of food allergy today, it will be interesting (and useful) to see where the future evidence from these studies falls.

19. “Shed light on” means (A) explain, (B) mystify, (C) opaque, (D) murky.

20. “Prevalence” means (A) impediment, (B) rareness, (C) narrow, (D) pervasiveness.

21. The word “fall” in the last paragraph means (A) slip, (B) decline, (C) lie, (D) drop.

Reading test article 4: Food and Medication Insecurity Tied to Poor Diabetes Control (source: <http://www.reuters.com/article/2014/12/29/us-food-medication-diabetes-economics-idUSKBN0K71EC20141229>)

People without reliable sources of food and medicine are more likely to have poor control over their diabetes, compared to those without such concerns, according to a new study.

Researchers found the likelihood of a person having poorly controlled diabetes increased by about 39 percent for each of the so-called economic insecurities they reported. “What we found is that food and medication are a big deal and probably account for the bulk of it, but it doesn’t look like there is any one thing,” said Dr. Seth Berkowitz, the study’s lead author from Massachusetts General Hospital in Boston.

22. “The bulk of” means (A) the major part of, (B) the entire part of, (C) the negligible part of, (D) the problematic part of.

Approximately 29 million Americans - about 9 percent of the U.S. population - have diabetes, according to the Centers for Disease Control and Prevention.

Type 2 is the most common form of diabetes and is often linked to obesity. In type 2 diabetes, the body’s cells may be resistant to the hormone insulin, or the body may not make enough of the hormone. Insulin gives blood sugar access to the body’s cells to be used as fuel.

23. In the text above, the word “resistant” means (A) compliant, (B) repellent, (C) tolerant, (D) subordinate.

There’s been speculation that the 2010 Patient Protection and Affordable Care Act – better known as Obamacare – would increase access to healthcare for people with diabetes, Berkowitz and his colleagues write in *JAMA Internal Medicine*.

24. “Speculation” means (A) conjecture, (B) notification, (C) illusion, (D) verification.

People with low incomes may not benefit as much from that increased access, they add, because getting more healthcare services does not mean also having access to food, medications and other items needed to control diabetes. For the study, the researchers used data collected from June 2012 through October 2013 from 411 people with diabetes at clinics and health centers in Massachusetts.

Massachusetts expanded healthcare access years before the rest of the country.

“I think what we’re looking at in Massachusetts is where the rest of the country will be in a few years,” Berkowitz said.

Most of the participants had insurance, about 46 percent of the participants had uncontrolled diabetes and about 40 percent reported some sort of inability to get food, medicine or other necessities.

Specifically, about 28 percent reported not taking their medicines because they couldn’t afford the drugs. About 14 percent said they couldn’t pay their utility bills, about 20 percent said they didn’t have reliable access to food and about 11 percent said their housing situation wasn’t stable.

Food and medication insecurities were tied to poor control over diabetes, the researchers found.

For example, about 64 percent of those who reported an unstable food supply had uncontrolled diabetes, compared to about 42 percent of those with food security.

While housing and energy insecurities were not tied to worse diabetes control, the study found that people with an overall greater number of insecurities had greater odds of being less in control of their diabetes.

25. “Greater odds of” implies (A) equal possibility, (B) lower possibility, (C) higher possibility, (D) random chance.

“I think it lets us know that even if we - nationwide - achieve the rate of insurance coverage in Massachusetts, these problems will still likely exist,” Berkowitz said. He added that the problem is likely beyond the healthcare system to solve, because the new research showed people with these insecurities were visiting their doctors. “You have people who are seeking care and seeing what they have, but . . . you’re just not getting people what they need to stay healthy,” Berkowitz said. “This is sort of a policy or system-level issue,” he said. “I don’t think there’s anything in the course of an individual visit that patients or physicians are going to be able to do.” Berkowitz added, though, that people should let their doctors and healthcare providers know if they are experiencing any of these difficulties.

26. According to the text, the following statement: “Berkowitz believes that diabetes control is a problem which can be handled solely with a reformed health care system” is (A) True, (B) False, (C) Not mentioned in the article.

Reading test article 5 (source: Cellular and Molecular Life Sciences 2001,58, 1234)

Bromelain is a crude extract from the pineapple that contains, among other components, various closely related proteinases, demonstrating, *in vitro* and *in vivo*, antiedematous, antiinflammatory, antithrombotic and fibrinolytic activities. The active factors involved are biochemically characterized only in part. Due to its efficacy after oral administration, its safety and lack of undesired side effects, bromelain has earned growing acceptance and compliance among patients as a phytotherapeutical drug. A wide range of therapeutic benefits has been claimed for bromelain, such as reversible inhibition of platelet aggregation, angina pectoris, bronchitis, sinusitis, surgical traumas, thrombophlebitis, pyelonephritis and enhanced absorption of drugs, particularly of antibiotics. Biochemical experiments indicate that these pharmacological properties depend on the proteolytic activity only partly, suggesting the presence of nonprotein factors in bromelain. Recent results from preclinical and pharmacological studies recommend bromelain as an orally given drug for complementary tumor therapy: bromelain acts as an immunomodulator by raising the impaired immunocytotoxicity of monocytes against tumor cells from patients and by inducing the production of distinct cytokines such as tumor necrosis factor- α , interleukin (IL)-1 β , IL-6, and IL-8. In a recent clinical study with mammary tumor patients, these findings could be partially confirmed. Especially promising are reports on animal experiments claiming an antimetastatic efficacy and inhibition of metastasis-associated platelet aggregation as well as inhibition of growth and invasiveness of tumor cells. Apparently, the antiinvasive activity does not depend on the proteolytic activity. This is also true for bromelain effects on the modulation of immune functions, its potential to eliminate burn debris and to accelerate wound healing. Whether bromelain will gain wide acceptance as a drug that inhibits platelet aggregation, is antimetastatic and facilitates skin debridement, among other indications, will be determined by further clinical trials. The claim that bromelain cannot be effective after oral administration is definitely refuted at this time.

27. Which of the following descriptions regarding bromelain is true (A) a type of pipeapple, (B) can be used as a medicine, (C) a pure compound, (D) has the ability to synthesize protein.
28. What is the major function of proteinases (A) build up amino acids, (B) enhance the function of proteins (C) degrade proteins (D) regulate the function of proteins.
29. What does anti-inflammation mean? (A) the ability of modulating the immune system, (B) the ability of killing cancer cells, (C) can remove reactive oxygen species, (D) control the movement of food through digestive tract.
30. Which of the following is NOT the activity of bromelain (A) anti-edema, (B) anti-fibrosis, (C) anti-inflammation, (D) anti-thrombosis.
31. According to this article, which of the followings is NOT true for Bromelain (A) the active factors are only partially characterized (B) is safe for use (C) served as a phytotherapeutic drug, (D) has undesired side effect.
32. When we are talking about an *in vitro* study, the study is probably held in (A) cells, (B) organs, (C) animals, (D) instruments.
33. Which of the followings is NOT the therapeutic benefits of bromelain (A) irreversible inhibition of platelet aggregation, (B) enhances absorption of antibiotics, (C) attenuates surgical traumas, (D) induces sinusitis.
34. From the results of the experiments mentioned in the article, which of the following components/properties of bromelain might provide the effect of anti-tumor (A) proteolytic activity, (B) IL-6, (C) tumor necrosis factor, (D) non-protein.
35. Which route is recommended for the administration of bromelain (A) oral, (B) IV, (C) IP, (D) SC.
36. A mammary tumor patient has lesions on (A) prostate, (B) breast, (C) thymus, (D) intestine.
37. Bromelain can raise the impaired immunocytotoxicity, the word "impaired" can be changed into (A) enhanced, (B) repaired, (C) defective, (D) single.
38. Which of the followings is a cytokine (A) interferon, (B) interleukin, (C) tumor survival factor, (D) transferrin.
39. The references cited in this article studied which of the following objects (A) animals, (B) humans, (C) both animals and humans, (D) drosophilas.
40. According to this article, which of the following descriptions is NOT correct (A) bromelain is used to assist tumor therapy, (B) monocytes of cancer patients probably cannot kill cancers cells effectively, (C) oral administration won't decrease the effect of bromelain, (D) the anti-invasive activity of bromelain relies on its proteolytic activity.
41. Which of the following activities of bromelain has nothing to do with the control of tumor cells (A) anti-thrombosis, (B) anti-metastasis, (C) anti-invasion, (D) anti-growth.

42. The claim is definitely refuted at this time, "refuted" can be replaced by which word
(A) accepted, (B) discussed, (C) recorded, (D) argued.
43. According to the author's opinion, if bromelain is proposed to be widely used, the following issue is important (A) the price, (B) safety, (C) more clinical trials should be performed, (D) market should be exploited.

Reading test article 6 (<http://journal.frontiersin.org/Journal/10.3389/fpsyg.2014.00852/abstract>.)

A diet of junk food not only make rats fat, but also reduces their appetite for novel foods, a preference that normally drives them to seek a balanced diet, reports a study published in the open-access journal *Frontiers in Psychology*. The study helps to explain how excessive consumption of junk food can change behavior, weaken self-control, and lead to overeating and obesity. The team of researchers, led by Professor Margaret Morris, Head of Pharmacology from the School of Medical Sciences, UNSW Australia, taught young male rats to associate each of two different sound cues with a particular flavor of sugar water- cherry and grape. Healthy rats, raised on a healthy diet, stopped responding to cues linked to a flavor in which they have recently overindulged. This inborn mechanism, widespread in animals, protects against overeating and promotes a healthy, balanced diet. But after 2 weeks on a diet that included daily access to cafeteria foods, including pie, dumplings, cookies, and cake - with 150% more calories - the rats' weight increased by 10% and their behavior changed dramatically. They became indifferent in their food choices and no longer avoided the sound advertising the overfamiliar taste. This indicate that they had lost their natural preference for novelty. The change even lasted for some time after the rats returned to a healthy diet. The researchers think that a junk diet causes lasting changes in the reward circuit parts of the rats' brain, for example, the orbitofrontal cortex, an area of the brain responsible for decision-making. They say these results may have implications for people's ability to limit their intake of certain kinds of foods, because the brain's reward circuitry is similar in all mammals. "The interesting thing about this finding is that if the same thing happens in humans, eating junk food may change our responses to signals associated with food rewards," says UNSW Professor Morris. "It's like you've just had ice cream for lunch, yet you still go and eat more when you hear the ice cream van come by."The World Health Organization estimates that over 10% of the world's adult population is obese and at least 2.8 million people die each year as a result of being overweight or obesity. Overweight and obesity are major risk factors for a number of chronic diseases, including diabetes, cardiovascular diseases, and cancer. "As the global obesity epidemic intensifies, advertisements may have a greater effect on people who are oversight and make snacks like chocolate bars harder to resist," adds Dr. Amy Reichelt, lead author of the paper and UNSW postdoctoral associate.

44. Which of the followings is junk food? (A) steak, (B) cherry, (C) kimchi, (D) chips
45. According to the report in *Frontiers in Psychology* mentioned in this article, which of

- the followings is NOT a consequence of eating junk food (A) reduce the appetite for novel foods, (B) drive rats to seek a balanced diet, (C) make the rats fat, (D) none of the above.
46. Which object might NOT be involved in Professor Morris's experiment (A) healthy rats, (B) young rats, (C) female rats, (D) none of the above.
47. Which of the descriptions regarding inborn mechanism is NOT true (A) restrict to rats, (B) promotes a healthy diet, (C) promotes a proportional diet, (D) provide protection against overeating.
48. According to this article, which of the followings is a sign of being indifferent in food choices in rat model (A) can hear nothing, (B) respond to the sound advertising the overfamiliar taste, (C) stop drinking sugar water, (D) drink too much.
49. According to the study mentioned in this article, eating junk food for two weeks would cause which of the following phenomenon (A) lose the natural preference for novelty, (B) cause some chronic disease, such as diabetes and cancer, (C) will be alert when ice cream van come by, (D) fail to make a decision.
50. Why does the author think the results mentioned in this article can be applied in humans (A) rat model has been adopted for long time, (B) food preference is similar between rodents and humans, (C) cafeteria foods applied in the experiment are the same as what we would have in a buffet, (D) brain's reward circuitry is similar in all mammals

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