

※ 注意：請於試卷內之「選擇題作答區」依序作答。

1-50 為單選題，每題 2 分，答錯倒扣 0.5 分

Article 1

(Source: The Organic & Non-GMO Report, March, 2009)

For the first time since 1996, acres of Roundup Ready genetically modified soybeans could drop as more farmers decide to plant non-GMO. Low commodity soybean prices, attractive premiums, and rising prices for genetically modified soybean seed are leading American farmers to plant more acres of non-GMO soybeans this year. Representatives with soybean associations, universities, and grain buyers all say that demand for non-GMO soybeans is growing, leading to more non-GMO acres. Genetically modified Roundup Ready soybeans have taken an increasingly larger percentage of US soybean acreage each year since their introduction in 1996, reaching 92% in 2008. But this could be the first year that the trend reverses. Grover Shannon, a soybean breeder with the University of Missouri, Delta Research Center, thinks non-GMO acreage could account for 10% of total soybean acreage this year.

“Record number of contracts”

“We are seeing more interest in growing non-GMO soybeans,” says Mark Albertson, director of marketing, Illinois Soybean Association. With commodity soybean prices around \$9.00 per bushel, a premium of \$1.00 or more for non-GMO is more attractive. “That is getting farmers’ attention,” Albertson says. For example, Iowa-based ASOYIA is paying farmers as much as \$2.75 per bushel to grow its non-GMO low linolenic soybeans. Albertson has talked to several farmers who haven’t grown non-GMO soybeans in eight years, but will this year because of the premiums. Grain companies large and small are contracting farmers to grow non-GMO. “We called all the companies buying non-GMO, and about one-half of them had enough acres,” Albertson said. “We are seeing a record number of non-GMO soybean production contracts being written this spring,” says Greg Lickteig, senior group manager, The Scoular Company. “It’s a tremendous response.” “We see more growers switching to non-GMO production for 2009 planting,” says Joe Hanusik, manager at Harmony Agricultural Products in Ohio. University soybean breeders also see growing demand for non-GMO soybeans. “The demand happened so fast. All of a sudden in the last year, farmers wanted to grow non-GMO soybeans,” Shannon says. “The demand has been increasing in the last two years,” says Bill Schapaugh, a soybean breeder at Kansas State University. “The demand in 2008 was greater than in 2007, and it is greater this year than in 2008.”

Increases in commodity and food-grade non-GMO

Grain buyers report that acreage increases are expected for both generic commodity non-GMO soybeans and specialty food-grade varieties. “Conventional varieties can capture a premium at the larger companies and many farmers like working with Cargill and ADM,” says Tim Daley, a soybean trader at Stonebridge, Ltd. “Higher premium food-grade beans are also getting the interest of producers due to the premiums over Chicago Board of Trade.” Chris Bradley, a trader with Ceres Commodities, sees a bigger increase in acreage of commodity non-GMO soybeans. “Identity preserved food-grade soybeans have increased as well but not to the degree of generic non-GMO,” he says.

“Farmers upset with Monsanto”

Besides the higher non-GMO premiums, there are other reasons for the increasing acreage of non-GMO this year. One is lower cost. “The Roundup Ready system is not

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as cheap as it used to be,” Shannon says. The cost for Monsanto’s Roundup Ready GM soybean seeds has increased from \$35 to \$50 per bag while the cost for Roundup herbicide has increased from \$15 to \$50 per gallon. “A lot of farmers are upset with Monsanto,” Shannon says. “It’s cheaper for farmers to plant non-GMO beans if they can limit their inputs and still capture a good price for their production,” Daley says. “Non-GMO seed varieties are now available at significantly lower prices than Roundup Ready lines,” Lickteig says. Lickteig also sees more farmers planting soybeans this year than corn. “With high inputs costs for seed, fertilizer, and herbicide, farmers are seeing the benefits of lower costs associated with putting in a non-GMO soybean crop compared to corn.” Increasing problems with weeds becoming resistant to Roundup/glyphosate is also a concern for farmers. “They are using more herbicides, which is an added cost,” Schapaugh says. The organic food industry is also spurring demand for non-GMO soybeans, says Craig Tomera, production agronomist/crop production manager at Northland Organic Foods. “Organic food companies are switching to non-GMO soybeans until prices for organics drop and the economy improves.”

Seed challenges

The non-GMO soybean market faces challenges, especially with seed. With the big emphasis on GM soybeans in recent years, many private seed companies have focused their breeding efforts on GM varieties and phased out non-GMO. “Seed companies are pushing GMO seed and so choices and quantities for non-GMO seed are getting less and less available,” Bradley says. “Seed is in short supply with high yielding non-GMO soybeans simply due to supply and demand,” Daley says. Shannon says the seed industry prefers selling GM seed because of the technology fee requiring that farmers buy seed every year; farmers can often save seed from non-GMO varieties. “The seed distributors don’t want to go back to selling non-GMO. They want to sell seed every year; it’s more profitable.” However, good non-GMO soybean seed varieties are becoming available through some private companies in the US and Canada and through many US universities. For those farmers wanting to jump on the non-GMO bandwagon, the time to act is now. “We are telling farmers that if they are interested in growing non-GMO, they better find a buyer now,” Albertson says.

Please choose the best answer according to the above article (2% or total points per question)

1. How long has Roundup Ready soybeans increased in its percentage of US soybean acreage? (1) from 1996 to 2009 (2) since 1996 (3) from 1996 to 2008 (4) forever.
2. What could be the percentage acreage of GMO-soybean this year? (1) 92% (2) 8% (3) 90% (4) 10%.
3. What leads American farmers to plant more non-GMO soybean this year? (1) the premium of non-GMO soybeans is increasing (2) GMO soybean is unhealthy (3) GMO soybean is more expensive (4) people got tired of GMO soybean.

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4. What is Monsanto? (1) an agriculture company (2) a dealer (3) a brand name (4) a herbicide trader.
5. How is identity-preserved food-grade soybeans compared to generic non-GMO soybeans? (1) generic non-GMO soybeans has less increase in acreage (2) both have increased premium (3) generic non-GMO soybeans has higher price (4) none of the above.
6. What is a Roundup Ready soybean? (1) a ready to eat soybean (2) a GMO soybean (3) a ready to cook soybean (4) a round shape soybean.
7. Why are farmers using more herbicides? (1) because herbicides are cheaper now (2) because weeds becoming resistant to herbicides (3) because they plant GMO soybeans (4) because the more herbicide they use the higher soybean price they can get.
8. Why farmers upset with Monsanto? (1) non-GMO seed price getting cheaper (2) Monsanto raised their herbicide price (3) Monsanto raised their soybean seed price (4) all of the above.
9. What is a commodity soybean? (1) an identity-preserved food-grade soybean (2) a food-grade soybean (3) a specialty non-GMO soybean (4) none of the above.
10. What challenges the non-GMO soybean market is facing? (1) many private seed companies have focused their breeding efforts on GM varieties (2) seed is in short supply with high yielding non-GMO soybeans (3) seed companies are pushing GMO seed (4) all of the above.

Article 2

U.S. Health Agencies Intensify Fight Against Zika Virus

(Source: NPR January 28, 2016)

A human study of Zika virus vaccine could begin as early as this year, U.S. health officials told reporters Thursday.

But the officials cautioned that it could be years before the vaccine is available for wide use.

The news came as the Zika virus continues to spread through the Americas. Still, a large outbreak is seen as unlikely in the U.S.

"There's still a lot we don't know, so we have to be very careful about making any absolute predictions," says Dr. Anthony Fauci, head of the National Institute of

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Allergy and Infectious Diseases. In a briefing for reporters, he added that "we still feel it's unlikely ... we'll see wide-scale outbreaks."

That's because the U.S. has seen only limited spread of two similar viruses, dengue and chikungunya, which are also carried by mosquitoes. They have spread widely in nearby countries but mostly appear sporadically in the U.S., mainly when travelers get them abroad and return home.

Nevertheless, the National Institutes of Health and the Centers for Disease Control and Prevention are launching an intense effort to combat Zika, officials said.

The CDC is now requiring all states to report any travelers who bring the virus into the country, says Dr. Anne Schuchat, the agency's principal deputy director.

So far, 31 such cases have been reported in 11 states and the District of Columbia.

None of these people is known to have spread the virus to anyone else. But some local person-to-person transmission has occurred in Puerto Rico, where 19 cases have been confirmed, Schuchat says. One case has also been confirmed in the U.S. Virgin Islands.

Schuchat acknowledged that "it's possible — even likely — we will see limited Zika transmission in the United States," but she agrees with Fauci that large-scale outbreaks are unlikely in the U.S.

The main reason is that the mosquitoes that spread the virus are primarily found only in Southern states, and the U.S. does a much better job of protecting people from mosquitoes than do other countries, Schuchat said.

That said, the agency would "remain vigilant" for any sustained transmission. "This is a rapidly changing situation," she said.

So CDC is collaborating with the NIH to develop better tests for the virus, and the NIH has issued a call for researchers already receiving funding for viruses like Zika to do more research to better understand how the virus.

Work is also underway to try to develop treatments, and the NIH is pursuing two possible strategies for developing a vaccine, Fauci said.

One involves creating a vaccine from a live, but harmless form of the virus. The other, which is probably more promising, involves using DNA from the virus to formulate a vaccine, he said.

That approach produced encouraging early results in the creation of a vaccine against the West Nile virus, Fauci said.

He predicted the work could create a vaccine that might be ready for early testing sometime this year. But, he added, "we will not have a vaccine this year or probably in the next few years."

Nevertheless, the NIH has already started talking with drug companies to help develop a vaccine. "Things are moving rapidly," Fauci said.

At the same time, the Food and Drug Administration has started taking steps to protect the blood supply against the virus, CDC's Schuchat said. The virus seems to remain in the bloodstream "very briefly," she said, perhaps for only about a week. "FDA is diligently working with its federal partners and with stakeholders, including blood collection establishments and industry organizations, to rapidly implement appropriate donor deferral measures for travelers who have visited affected regions in order to protect the blood supply," FDA spokeswoman Tara Goodin said in an email.

Please indicate the following statements are Yes, No or Not Given according to the passage above. Write Y, N or NG respectively.

Yes (Y) if the statement agrees with the passage above

No (N) if the statement contradicts with the passage above

Not Given (NG) if the statement is not mentioned in the passage above

11. The National Institutes of Health and the Centers for Disease Control and Prevention are launching an intense effort to combat Zika in US.
12. The NIH has already started talking with drug companies to help develop a vaccine because "Things are moving rapidly,".
13. Dr. Anne Schuchat disagrees with Fauci that large-scale outbreaks are unlikely in the U.S.
14. FDA will also put in place recommendations to help maintain a safe blood supply in United States territories where the virus is present.
15. So far, 31 such cases have been reported in 10 states and the District of Columbia in US.

Article 3

Childhood Vaccination Rates Climb In California

(Source: NPR, January 21, 2016)

Maybe it was last January's big measles outbreak at Disneyland that scared more California parents into getting their kids vaccinated. Or maybe health campaigns have become more persuasive. Or maybe schools getting stricter about requiring shots for entry made a difference.

Whatever the reasons, childhood vaccination rates last fall went up in 49 of 58 counties in California, according to data released Tuesday by state health officials.

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The California Department of Public Health annually reports vaccination data for kindergartners from nearly all public and private schools statewide. For the 2015-2016 school year, 92.9 percent of kindergartners were up-to-date on their shots — an increase of 2.5 percentage points from the previous term.

In California, as in the rest of the nation, 2015 was a year of heated debate around vaccines. It started last January with the first reports of a measles outbreak tied to Disneyland. Then, in early February, state lawmakers introduced a bill to eliminate the personal belief exemption, which has allowed California parents to easily refuse vaccines on behalf of their children.

The repeal of that exemption became law, to take effect in July 2016. But the percentage of parents citing personal belief exemptions is already declining in California, the newly released data show — from 2.54 percent of incoming kindergartners in 2014-15 to 2.38 percent this year. In addition, the percent of children receiving both doses of the vaccine against measles, mumps and rubella — or MMR — has increased from 92.55 percent to 94.59 percent statewide.

"I can only assume that this is in part a response to ... the measles outbreak and the publicity that that received," says Dr. Art Reingold, head of epidemiology at the University of California, Berkeley School of Public Health. "It's unfortunate that fear or outbreaks of disease are necessary to get people to do what we'd like them to do, but I think that's human nature."

Even Marin County, a hotbed for the anti-vaccine movement, saw its personal exemption claims drop — from 6.45 percent last year to 5.97 percent this year. The county's public health officer, Dr. Matt Willis, calls the decline in Marin's rate "great news," and notes that this is the third year in a row of increasing vaccination rates. "We haven't seen this many children vaccinated in Marin County since 2007," he says.

Still, a decline in the number of parents formally refusing to vaccinate their kids isn't the only reason for the statewide improvement in vaccination rates, according to James Watt, chief of the division of communicable diseases in the state's department of public health. Another big factor, Watts says, is a decline in what are known as "conditional admissions" to schools.

These are kids who show up on their first day of school having received some — but not all — of the required immunizations. Often, schools go ahead and allow these children to start class, with the understanding that their parents will make sure the students get the remaining shots as soon as possible. But that's not what the law demands.

"If those children could get a dose 'today,' they're not supposed to be admitted to school," Watt says. The problem, he explains, is that lots of kids have been enrolling

with "conditional entry" who don't go on to get the rest of their shots.

By working with parents and school districts to explain and enforce the rules — and vaccinate more kids — the state was able to reduce the overall number of conditional admissions from 6.9 percent of all enrolled kindergartners in 2014-2015 to 4.4 percent this year.

"The outbreak of measles was a real wake-up call for all of us around this issue," Willis says. "It gave us a chance to speak openly as a community about what vaccination does for us. It gave us a chance to understand vaccination as a matter of community responsibility."

Please indicate the following statements are Yes, No or Not Given according to the passage above. Write Y, N or NG respectively.

Yes (Y) if the statement agrees with the passage above

No (N) if the statement contradicts with the passage above

Not Given (NG) if the statement is not mentioned in the passage above

16. Maybe it was last July's big measles outbreak at Disneyland that scared more California parents into getting their kids vaccinated.
17. Starting with the 2016-2017 school year, all kindergartners and seventh-graders in California will need to be up-to-date on their immunizations to enter school.
18. For the 2015-2016 school year, 92.9 percent of kindergartners were up-to-date on their shots — an increase of 2.5 percentage points from the previous term.
19. "It's unfortunate that fear or outbreaks of disease are necessary to get people to do what we'd like them to do, but I think that's human nature." Said by Dr. Art Reingold, head of epidemiology at the University of California, Berkeley School of Public Health.
20. By working with parents and school districts to explain and enforce the rules — and vaccinate more kids — the state was able to increase the overall number of conditional admissions from 4.4 percent of all enrolled kindergartners in 2014-2015 to 6.9 percent this year.

Article 4
(Source: PNAS, March, 2009)

The striking prevalence of obesity world-wide is a significant health problem due to serious medical complications that include hypertension, insulin resistance, diabetes, coronary artery disease, and heart failure. Evidence is emerging that elevated serum free fatty acid (FA) levels contribute to the pathogenesis of the metabolic syndrome and heart disease. Whereas adipocytes have a unique capacity to store excess FAs in the

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form of triglyceride in lipid droplets, non-adipose tissues such as cardiac myocytes and pancreatic β -cells have a limited capacity for storage of lipids. In hyperlipidemic states, accumulation of excess lipid in non-adipose tissues leads to cell dysfunction and/or cell death, a phenomenon known as lipotoxicity. Excess lipid accumulation in skeletal muscle is associated with the development of insulin resistance. Lipid overload in pancreatic β -cells leads to dysregulated insulin secretion and apoptotic cell death, both of which may contribute to the genesis of diabetic states. Lipoapoptosis is also observed in the heart, in which it leads to the development of heart failure. In a variety of experimental systems, saturated and unsaturated FAs differ significantly in their contributions to lipotoxicity. Previous studies in Chinese hamster ovary (CHO) cells, cardiac myocytes, pancreatic β -cells, breast cancer cell lines, and hematopoietic precursor cell lines all suggest that lipotoxicity from accumulation of long chain FAs is specific for saturated FAs. This selectivity has been attributed to the generation of specific proapoptotic lipid species or signaling molecules in response to saturated but not unsaturated FAs. The nature of such signals may differ across cell types, but includes reactive oxygen species generation, *de novo* ceramide synthesis, nitric oxide generation, decreases in phosphatidylinositol-3-kinase, and primary effects on mitochondrial structure or function. Long chain FAs may also suppress anti-apoptotic factors such as *BclII*. Cosupplementation with unsaturated FAs has been shown to rescue saturated FA-induced lipoapoptosis by an unknown mechanism. The present study was designed to characterize the fundamental cellular mechanisms through which the common saturated and unsaturated dietary lipids, palmitic and oleic acids, exert their differential effects on survival of cultured cells. We provide evidence that the differential toxicity of these FAs is directly related to their ability to promote triglyceride accumulation. We show that exogenous or endogenously generated unsaturated FAs rescue palmitate-induced apoptosis by promoting palmitate incorporation into triglyceride. Moreover, oleic acid, as well as palmitic acid, is toxic in cells with impaired triglyceride synthetic capacity. *In vivo*, triglyceride accumulation in non-adipose tissues occurs in the setting of mismatch between cellular lipid influx and lipid utilization. Our study suggests that triglyceride accumulation in non-adipose cells in response to acute lipid overload represents an initial cellular defense against lipotoxicity.

21. Obesity occurs in (1) western society (2) rich areas (3) developing countries (4) the whole world.
22. Why obesity is a health problem (1) associated with many diseases (2) leads to lipid accumulation in the body (3) increases weight (4) reduces locomotion.
23. The medical complications of obesity are largely caused by elevated (1) blood

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- glucose (2) serum cholesterol (3) serum free fatty acid (4) serum triglyceride.
24. According to the article, which of the followings exhibits the capacity for lipid storage (1) adipose tissue (2) cardiac myocytes (3) pancreatic β -cells (4) all of the above.
25. Excess fatty acids will be converted to which of the followings in lipid droplets (1) ceramide (2) reactive oxygen species (3) triglyceride (4) none of the above.
26. What is the consequence of excess lipid accumulation in skeletal muscle (1) obesity (2) decreased insulin secretion (3) muscle dysfunction (4) insulin resistance
27. What is the consequence of excess lipid accumulation in pancreatic b-cells (1) obesity (2) decreased insulin secretion (3) tumorigenesis (4) insulin resistance
28. Accumulation of excess lipid in non-adipose tissues would cause (1) lipotoxicity (2) obesity (3) tumor (4) generation of saturated fatty acids.
29. According to the article, which of the following cell models were not adopted to conclude that lipoapoptosis results from specific form of fatty acids (1) hematopoietic precursor cell (2) breast cancer cell (3) neuron cell (4) CHO.
30. As summarized in this article, which of the followings might contribute to the prevention of lipotoxicity (1) synthesis of unsaturated fatty acids (2) synthesis of saturated fatty acids (3) accumulation of triglyceride (4) impaired palmitic acid synthetic capacity.

Article 5

Anti-inflammatory effects of a triple-bond resveratrol analog: Structure and function relationship

(Source: European Journal of Pharmacology , 2015)

Resveratrol is a polyphenol found in grapes and red wine, showing well-characterized anti-inflammatory and antiproliferative activities. In order to exceed resveratrol's biological effects and to reveal the structural determinants of the molecule's activity, numerous derivatives were synthesized recently. Most of these resveratrol analogs vary from the original molecule in the number, position or identity of the phenolic functional groups. Investigation of the analogs provided important data regarding structure-activity relationship of the molecule. With the exception of cis- and trans-resveratrol and the reduced form dihydroresveratrol, little is known about the molecular effects of the stilbene backbone. In the present study we investigated the anti-inflammatory properties of a new, triple-bond resveratrol analog, 3,4',5-trihydroxy-diphenylacetylene (TDPA) on lipopolysaccharide-stimulated RAW

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macrophages. We found that the analog had weaker antioxidant activity and stronger inhibitory effect on nuclear factor-kappaB activation, and on cyclooxygenase-2, tumor necrosis factor α and interleukin-6 production. It also prevented lipopolysaccharide-induced depolarization of the mitochondrial membrane. In contrast to resveratrol, TDPA increased the phosphorylation of c-Jun N-terminal and p38 mitogen activated protein kinases. In summary, we identified a novel compound with better anti-inflammatory properties than resveratrol. Our results contributed to a better understanding of the structural determinants of resveratrol's biological activities.

31. What is the main purpose of this research? (A) To understand the structure-activity relationship of resveratrol. (B) To evaluate the antioxidant of resveratrol. (C) To evaluate the anti-inflammatory activity of resveratrol. (D) To investigate the antiproliferative activity of resveratrol.
32. What is TDPA? (A) cis-resveratrol (B) trans-resveratrol (C) triple-bond resveratrol analog (D) pterostilbene
33. Compare with resveratrol, which one of the following statements is incorrect? (A) TDPA has better antioxidant activity (B) TDPA has stronger anti-inflammatory activity (C) TDPA has stronger inhibitory effect on cyclooxygenase-2 expression (D) TDPA has stronger inhibitory effect on interleukin-6 production
34. Which of the following cells is used in this study? (A) macrophage cells (B) liver cells (C) colon cells (D) B cells
35. According to this article, which of the following play an important role in the chemical structure of stilbene (A) hydroxyl groups (B) methyl groups (C) phenolic groups (D) carbon backbone

Article 6

Impact of increasing fruit and vegetables and flavonoid intake on the human gut microbiota

(Source: Food and Function, 2016)

Epidemiological studies have shown protective effects of fruits and vegetables (F&V) in lowering the risk of developing cardiovascular diseases (CVD) and cancers. Plant-derived dietary fibre (non-digestible polysaccharides) and/or flavonoids may mediate the observed protective effects particularly through their interaction with the gut microbiota. The aim of this study was to assess the impact of fruit and vegetable (F&V) intake on gut microbiota, with an emphasis on the role of flavonoids, and further to explore relationships between microbiota and factors associated with CVD

risk. In the study, a parallel design with 3 study groups, participants in the two intervention groups representing high-flavonoid (HF) and low flavonoid (LF) intakes were asked to increase their daily F&V intake by 2, 4 and 6 portions for a duration of 6 weeks each, while a third (control) group continued with their habitual diet. Faecal samples were collected at baseline and after each dose from 122 subjects. Faecal bacteria enumeration was performed by fluorescence *in situ* hybridisation (FISH). Correlations of dietary components, flavonoid intake and markers of CVD with bacterial numbers were also performed. A significant dose X treatment interaction was only found for *Clostridium leptum-Ruminococcus bromii/flavefaciens* with a significant increase after intake of 6 additional portions in the LF group. Correlation analysis of the data from all 122 subjects independent from dietary intervention indicated an inhibitory role of F&V intake, flavonoid content and sugars against the growth of potentially pathogenic clostridia. Additionally, we observed associations between certain bacterial populations and CVD risk factors including plasma TNF- α , plasma lipids and BMI/waist circumference.

36. What is the main purpose of this research? (A) To evaluate the relationships between fruit & vegetable, microbiota and factors associated CVD risk. (B) To evaluate the relationships between high fat and factors associated CVD risk. (C) To evaluate the relationships between microbiota and factors associated cancer. (D) To explore the the relationships between fruit & vegetable associated CVD risk.
37. According to the article, which sample was used for detecting the bacterial enumeration (A) Blood (B) stool (C) vegetables & fruits (D) urine
38. The bacterial enumeration was detected by (A) Western bolt (B) Southern blot (C) FISH (D) PCR
39. According to this study, which of following statement is correct? (A) F&V intake, flavonoid content and sugars significantly inhibit the growth of potentially pathogenic clostridia. (B) F&V intake, flavonoid content and sugars significantly increase the growth of potentially pathogenic clostridia. (C) F&V intake, flavonoid content and sugars did not affect the growth of potentially pathogenic clostridia. (D) F&V intake, flavonoid content and sugars significantly inhibit the growth of *Clostridium leptum-Ruminococcus bromii/flavefaciens*.
40. According to the article, which of the following **is not** the CVD risk factor? (A) IL-1 (B) plasma lipids (C) plasma TNF- α (D) BMI/waist circumference

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Article 7

(Source: Natural products insider, 2014)

Using a protein blend of soy, casein and whey post-workout prolongs the delivery of select amino acids to the muscle for an hour longer than using whey alone, according to a new study published in the *Journal of Applied Physiology*. It also shows a prolonged increase in amino acid net balance across the leg muscle during early post-exercise recovery, suggesting prolonged muscle building.

The double-blind, randomized clinical trial included 16 healthy subjects, ages 19 to 30, to assess if consumption of a blend of proteins with different digestion rates would prolong amino acid availability and lead to increases in muscle protein synthesis after exercise. The protein beverages provided to study subjects consisted of a soy-dairy blend (25 percent isolated soy protein, 50 percent caseinate, 25 percent whey protein isolate) or a single protein source (whey protein isolate). Muscle biopsies were taken at baseline and up to 5 hours after resistance exercise. The protein sources were ingested 1 hour after exercise in both groups.

Results concluded that consuming a soy-dairy blend leads to a steady rise in amino acids and an increase in select amino acid delivery for about an hour longer than the use of whey protein alone. The blend also sustained a greater positive net amino acid balance than whey, suggesting there is less muscle protein breakdown during the time period shortly after consumption of a blended protein product.

"This study sheds new light on how unique combinations of proteins, as opposed to single protein sources, are important for muscle recovery following exercise and help extend amino acid availability, further promoting muscle growth," said Blake B. Rasmussen, Ph.D., chair, department of Nutrition & Metabolism at the University of Texas Medical Branch and lead researcher of the study.

It's no surprise protein's popularity has been growing among consumers. The NPD Group study showed 24.9% of consumers look for protein on the Nutrition Facts label and 78% of consumers said protein contributes to a healthy diet. Half of those consumers say they want more protein in their diet.

"Because of the increased demand for high-quality protein, this study provides critical insight for the food industry as a whole, and the sports nutrition market in particular," said Greg Paul, Ph.D., global marketing director, DuPont Nutrition & Health. "With more and more consumers recognizing the importance of protein for their overall health and well-being, the results of this study have particular relevance to a large

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segment of the population, from the serious sports and fitness enthusiast to the mainstream consumer."

This is only part of a growing body of research that points to the value of dairy ingredients in sports nutrition. And dairy proteins aren't just for muscle—athletes interested in maintaining or losing weight can also benefit from high-quality dairy proteins. Coupled with soy protein ingredients—which have no cholesterol and are low in saturated fat—the possibilities are endless.

41. Why consuming a blend of protein from different sources could extend the amino acid availability being delivered to the muscle? (A) it becomes a better protein (B) it contain similar amino acid to the muscle protein (C) it is digested and released at different rate (D) plant protein is higher quality than animal protein.
42. Prolonged muscle building is suggested by (A) amino acid net balance (B) bigger muscle mass (C) higher content of better quality protein (D) less muscle protein breakdown.
43. According to the article, who will be the regular consumer for protein supplementary product? (A) Sport lover (B) people trying to lose weight (C) fitness enthusiast (D) all of he above.
44. What may not be the important quality of protein to be recognized as high quality protein product? (A) high amount of amino acid (B) no cholesterol (C) low saturate fat (D) contain variety of amino acids.
45. Where could whey protein being isolated from? (A) soy beans (B) milk (C) soy milk (D) all of the above.

Article 3

(Source: J. of Agric. Food Chem., 2011)

"Antioxidant", especially as the term **pertains** to substances with the capacity to influence health and well-being, in contrast to antioxidants that are used for technical functionality in the food industry, often is used as a marketing tool by the food industry. The use of the term in advertisements or on package labeling has been used to market whole foods or beverages, additives to foods (especially in "functional foods"), or dietary supplements. The advertised benefits of antioxidants include slowing the aging process and decreasing the risk of chronic disease. Scientific understanding of the functions and health roles of antioxidants is changing, and

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nutritional messages used to market antioxidant-containing foods often are not supported by contemporary evidence. This raises several issues for the food industry:

(i) The term “antioxidant” is indistinct and sends multiple messages. For example, in food processing “antioxidants” may be ingredients added to retard spoilage, whereas the term may be synonymous with “high Oxygen Radical Absorbance Capacity (ORAC) value” to some, and it may imply endogenous compounds such as glutathione, vitamin E, and selenium to others. New findings now show that the term can be applied to many compounds not previously considered to be antioxidants (including some that are chemically pro-oxidants) because they have surprisingly strong antioxidant activity *in vivo*. To prevent confusion among consumers, a more specific nomenclature may be necessary.

(ii) Available scientific evidence does not necessarily support the assumption that all reactive oxygen species (ROS) present health risks and should be reduced to as low levels as possible. This has implications for the fortification of foods with antioxidants, as well as for the consumption of many dietary supplements. A corollary is that supplemental doses of some antioxidants may block beneficial actions of other physiological processes, and at high doses some antioxidants may be toxic.

Studies have shown that a sizable portion of the public exhibits “**consumer backlash**” against nutritional messages. Many are confused with the changing messages within scientific, health, and policy circles, and many do not think that government should be involved in something as personal as food choice. This places much of the responsibility for clear messages regarding the benefits of specific foods and nutrients on the food industry. Clarifying the message regarding antioxidants without engendering consumer backlash will be important.

The present understanding of antioxidant function by the public is a consequence, in part, of relying on incomplete and preliminary data to develop overarching hypotheses and messages. Nutrition professionals urge an “evidence-based” approach that places much reliance on human studies for developing/ assessing nutritional messages for public consumption. The food industry may find that a similar approach, although presenting many initial marketing challenges, results in a more attentive and enthused consumer.

46. Which of the following word has different meaning with **pertains** in the paragraph? (A) apply (B) associate (C) alternate (D) refer.

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47. Which of the following description is true? (A) ROS is bad for our health and should be completely removed. (B) antioxidant should be consumed at high level in order to promote optimal health condition (C) antioxidant is used in the food industry to prevent spoilage (D) Pro-oxidant induces oxidation
48. What is ORAC? (A) a government agency (B) food labeling claim (C) method of measuring antioxidant capacities (D) antioxidant standard compound.
49. What is not an antioxidant? (A) glutathione (B) vitamin C (C) seleno-compound (D) Iron
50. What is the meaning of **backlash** in the article? (A) resignation (B) opposition (C) forbearance (D) applause

試題隨卷繳回