

## 令和7年度入学者選抜学力検査問題

# 英 語

### 注 意 事 項

1. この冊子は、監督者から解答を始めるよう合図があるまで開いてはいけません。
2. 監督者から指示があったら、解答用紙の上部の所定欄に受験番号と座席番号を、また、下部の所定欄には座席番号をそれぞれ記入しなさい。その他の欄に記入してはいけません。
3. 解答用紙は、記入の有無にかかわらず、持ち帰ってはいけません。
4. この冊子は持ち帰りなさい。
5. 落丁、乱丁または印刷不備があったら申し出なさい。





I 次の文章を読み、問1～問7の設問に答えなさい。\*が付いている語には、本文の後に注があります。

Apart from Garfield's\* legendary love of lasagna\*, perhaps no food is more associated with cats than tuna. The dish is a staple of everything from *The New Yorker* cartoons to Meow Mix jingles — and more than 6% of all wild-caught fish goes into cat food. Yet <sup>(1)</sup>tuna (or any seafood for that matter) is an odd favorite for an animal that evolved in the desert. Now, researchers say they have found a biological explanation for this curious craving.

In a study published this month in *Chemical Senses*, scientists report that cat taste buds\* contain the receptors needed to detect *umami* — the savory, deep flavor of various meats, and one of the five basic tastes in addition to sweet, sour, salty, and bitter. Indeed, *umami* appears to be the primary flavor cats seek out. That's no surprise for an obligate carnivore\*. But the team also found these cat receptors are uniquely tuned to molecules found at high concentrations in tuna, revealing why our feline\* friends seem to prefer this delicacy over all others.

“This is an important <sup>(2)</sup>study that will help us better understand the preferences of our familiar pets,” says Yasuka Toda, a molecular biologist at Meiji University and a leader in studying the evolution of *umami* taste in mammals and birds. The work could help pet food companies develop healthier diets and more palatable\* medications for cats, says Toda, who was not involved with the industry-funded study.

Cats have a unique palate. They can't taste sugar because they lack a key protein for sensing it. That's probably because there's no sugar in meat, says Scott McGrane, a flavor scientist and research manager for the sensory science team at the Waltham Petcare Science Institute, which is owned by pet food-maker Mars Petcare UK. There's a saying in evolution, he says: “<sup>(3)</sup>If you don't use it, you lose it.” Cats also have fewer bitter taste receptors than humans do — a common trait in uber-carnivores.

But cats must taste *something*, McGrane reasoned, and that something is likely the savory flavor of meat. In humans and many other animals, two genes — *Tas1r1* and *Tas1r3* — encode proteins that join together in taste buds to form a receptor that detects *umami*. Previous work had shown that cats express the *Tas1r3* gene in their taste buds, but it was unclear whether they had the other critical puzzle piece.

So McGrane and colleagues biopsied\* the tongue of a 6-year-old male cat that had been euthanized\* for health reasons unrelated to the study. Genetic sequencing revealed his taste buds expressed both the *Tas1r1* and *Tas1r3* genes — the first time scientists showed that cats have all the molecular machinery needed to detect *umami*.

When the researchers compared the protein sequences encoded by these genes with those of humans, however, <sup>(4)</sup>they found a striking difference: Two critical sites that allow the human receptor to bind to glutamic and aspartic acid\* — the main amino acids that activate *umami* taste in people — were mutated\* in cats. “So I began thinking, maybe cats *can’t* taste *umami*,” McGrane says.

To double check, he and his team engineered cells to produce the cat *umami* receptor on their surface. They then exposed the cells to a variety of amino acids and nucleotides\*. The cells did respond to *umami* — but with a twist. In people, the amino acids bind first and the nucleotides amplify the response. But in cats, the nucleotides activated the receptor, and the amino acids further boosted it, McGrane says. “That’s the exact opposite of what we see in people.”

In the last part of the experiment, McGrane and colleagues gave 25 cats a taste test. In a series of trials, they presented the felines with two bowls of water, each with various combinations of amino acids and nucleotides, or just water alone. The cats showed a strong preference for bowls that contained molecules found in *umami*-rich foods, suggesting this flavor — above all others — is the primary motivator for cats.

“I think <sup>(5)</sup>[important / is / sweet / as / for / *umami* / as / humans / for / is / cats],” Toda says. Dogs, she notes, can taste both sweet and *umami*, which may explain why they’re not such fussy eaters.

But it wasn’t just *umami* in general the cats craved. The felines showed a particular preference for bowls containing histidine\* and inosine monophosphate\* — compounds found at particularly high levels in tuna. “It was one of the most preferred combinations,” McGrane says. “It really seems to hit that *umami* sweet spot.”

That jibes with\* Toda’s personal experience. When she was a veterinary\* student, she got cats with no appetite to eat by sprinkling their food with dried flakes of bonito — a common *umami* ingredient in Japan and a close relative of tuna. “It worked very well!” she says.

Indeed, one application of the work could be developing foods that are more palatable to cats, McGrane says. He also thinks a spoonful of *umami* (figuratively speaking\*) could help feline medications go down easier — <sup>(6)</sup>welcome news for anyone who’s almost lost a finger trying to pill a cat.

Why cats have a hankering\* for tuna in the first place remains a mystery. They evolved in the deserts of the Middle East about 10,000 years ago, where fish of any kind was unlikely to be on the menu.

It may have been a taste cats developed over time. As far back as 1500 B.C.E.\*, cats are depicted eating fish in the art of Ancient Egypt. And by the Middle Ages, felines in some Middle Eastern ports were consuming large quantities of fish — including tuna — likely because they were feasting on the scraps left by fishers. In both cases, cats that evolved a taste for fish — and perhaps tuna in particular — may have had an advantage over their comrades\*, says Fiona Marshall, a zooarchaeologist\* at Washington University in St. Louis.

“We’re at a starting point — it’s not a finished story,” McGrane admits. “<sup>(7)</sup>But all of this work is building up to our basic understanding of what it means to be a cat.”

出典：David Grimm. “Why do cats love tuna so much? Scientists may finally know” *Science*, August 25, 2023. 一部改変。

(注) Garfield ネコのキャラクター

lasagna ラザニア料理

taste buds 味蕾, 味覚芽

carnivore 肉食動物

feline ネコ科の(動物)

palatable 味の良い

biopsied (～に)生体検査を行った

euthanized 安楽死させられた

glutamic and aspartic acid グルタミン酸とアスパラギン酸

mutated 突然変異した

nucleotides ヌクレオチド

histidine ヒスチジン

inosine monophosphate イノシンーリン酸塩

jibes with ～と一致する

veterinary 獣医学の

figuratively speaking たとえて言うならば

hankering (～を手に入れたいという)切望

B.C.E. 紀元前(Before the Common Era)

comrades 同類

zooarchaeologist 動物考古学者

問 1 下線部(1)を日本語に訳しなさい。

問 2 下線部(2)について、この研究の内容を日本語で説明しなさい。

問 3 下線部(3)はネコについて、具体的にどのようなことを述べているか、日本語で説明しなさい。

問 4 下線部(4)の “a striking difference” とはどのようなことか。本文の内容に即して、日本語で説明しなさい。

問 5 下線部(5)を意味が通るように最も適切な順番に並び替えなさい。

問 6 下線部(6)について、“anyone” とは具体的にどのような人のことか、日本語で説明しなさい。

問 7 下線部(7)を日本語に訳しなさい。

Ⅱ 次の文章を読み、問 1～問 7 の設問に答えなさい。\*が付いている語には、本文の後に注があります。また、本文中[…]とあるのは原文を省略していることを示しています。

出典：Jessica Brown. “How much water should you drink a day?” *BBC News*, March 16, 2024. 一部改変。

※許諾が取れていないため本文掲載箇所削除



- (注) deigning (プライドを捨てて)～する  
pint 《液量単位》パイント(イギリスでは0.57リットル)  
bombarded 浴びせられる  
nutritionists 栄養学者  
lubricant 潤滑剤  
urination 排尿  
dehydration 脱水  
deteriorate 低下する  
unsubstantiated 根拠のない  
kidneys 腎臓  
hydrate 水分補給する  
diuretic 利尿の  
subjects 被験者  
alleged 主張された  
complexion 顔色  
dilution (液体を)薄めること  
sodium ナトリウム  
fallacies 間違い  
stark 極端な  
loo トイレ

- 問 1 下線部(1)について、時代とともに何がどのように変わったと説明されているか、本文の内容に即して、日本語で答えなさい。
- 問 2 下線部(2)の “two pieces of guidance” の内容を本文に即して、日本語で説明しなさい。
- 問 3 下線部(3)を日本語に訳しなさい。

問 4 下線部(4)を意味が通るように最も適切な順番に並び替えなさい。

問 5 下線部(5)の研究では、どのような実験が実施され、どのような結果が得られたかを、本文の内容に即して日本語で説明しなさい。

問 6 下線部(6)の“distrustful”とはどのような状態を示しているか、本文の内容に即して日本語で説明しなさい。

問 7 下線部(7)の“a one-size-fits-all approach isn't the answer”の内容はどのようなことか、日本語で説明しなさい。



- III 次の文章はジャックと母親の話である。下線部(1)～(10)に、意味が通じるように適切な英語を書き入れて、ストーリーを完成させなさい。ただし、括弧内の単語をそのままの形で用い、指定された数の単語を使用すること。本文中[...]とあるのは原文を省略していることを示しています。

### Lazy Jack

#### An English folktale

Once, long ago in England, there lived a boy called Jack and his old, widowed mother. They were very poor. The old woman worked hard all day spinning and weaving and somehow managed to (1)\_\_\_\_\_ (enough を含めて 3 語) to feed herself and Jack. Jack, though a strong and healthy boy, was too lazy to do anything.[...]

One day his mother said to him, “Jack, get up. Go out and find some work, and don’t come back unless you have earned your evening meal.”

Jack looked at his mother in surprise, but went off to find some work. He went to work for a farmer. Jack worked hard all day long, and when it (2)\_\_\_\_\_ (time を含めて 5 語), the farmer gave him his wages — a big, round, shiny penny. Jack took the penny and set off happily for home. On the way he had to cross a brook, and as he hopped and skipped across the stream, the penny fell into the water. When he reached home, he told his mother what had happened.

“Oh you silly boy,” cried his mother. “You should have put the penny in your pocket. Then you would not have dropped it.”

“Next time I will do that,” replied Jack.

The next day Jack set off again in search of work, and worked for a dairy farmer. At the end of the day the dairy farmer paid him his wages — a jar of warm fresh cow’s milk. Jack, remembering (3)\_\_\_\_\_ (said を含めて 5 語) the previous day, carefully put the jar of milk in his pocket. Of course, he had

spilled the milk long before he reached home.

"You should have carried the jar on your head," cried his mother. "Then you would not have spilled it."

"Next time," replied Jack.

The next day Jack worked for a farmer once again. At the end of the day, the farmer paid Jack with a large slice of fresh cream cheese. Jack thanked the farmer and set off for home, taking care to balance the cheese on his head. Of course, <sup>(4)</sup>\_\_\_\_\_ (time を含めて 5 語) home, the cheese had melted and run into his hair!

"You stupid boy!" cried his mother in despair. "You should have carried the cheese in your hands."

"Next time," replied Jack, and went off sadly to wash the cheese out of his hair.

The following day, Jack set off once more to find work. This time he worked for a baker, who gave him a large cat as his wages. Jack set off for home, holding the cat carefully in his hands. But the cat didn't like that, and scratched him <sup>(5)</sup>\_\_\_\_\_ (badly を含めて 3 語) he had to let it go.

"You should have tied it with a string and dragged it along after you," said his mother.

"Next time," said Jack.

The next day Jack went out again and worked for a butcher, who paid him generously with a large shoulder of mutton. Jack tied the mutton carefully with a string, and dragged it along after him all the way home. Of course, when he got home, the meat was completely ruined.

His mother looked at him sadly. "You should have carried it on your shoulder," she wept, holding her head in her hands.

Jack patted his mother soothingly on her shoulder and replied, "Don't cry mother, next time <sup>(6)</sup>\_\_\_\_\_ (remember を含めて 5 語) it on my shoulders."

The following day Jack worked for a cattle-keeper, who gave him a donkey

as his wages. Jack remembered what his mother had told him, and being a strong boy, hoisted the donkey on to his shoulders and set off for home, whistling cheerfully. This time he was sure he had got it right, and he smiled happily, thinking of the joy on his mother's face when he got home with the donkey.

Now, along the path that led Jack home, there lived a rich man with his only daughter. The rich man's daughter suffered from a serious illness. She couldn't speak or hear, and the doctors had declared that she <sup>(7)</sup>\_\_\_\_\_ (cured を含めて 4 語) unless she laughed. The rich man had tried everything to make her laugh — but no one and nothing had made her laugh. At last, in despair, he had declared that he would give half his fortune and his daughter in marriage to any man who made her laugh. Many had tried but <sup>(8)</sup>\_\_\_\_\_ (none を含めて 3 語).

That evening, as Jack passed by, the rich man's daughter was standing at her window. She stared at Jack in surprise — was that really a donkey he had on his back? As he came closer, she saw that it was true, and the sight of the poor animal on the young man's back, its legs flailing helplessly in the air, struck her as so comical that <sup>(9)</sup>\_\_\_\_\_ (laugh を含めて 4 語), and instantly became able to speak and hear.

The rich man, overjoyed that his daughter was well again, <sup>(10)</sup>\_\_\_\_\_ (kept を含めて 3 語) and married her to Jack. So Jack became a rich man himself and lived in a large house with his wife. He brought his mother to live with them, and she spent the rest of her days in comfort and ease.

*This retelling is based on the story of Lazy Jack recorded by Joseph Jacobs in his collection English Fairy Tales (1890). 一部改変。*









