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## Health

# Men may eat more in summer as the sun makes them hungry

Clare Wilson

WINTER may be seen as the time to fill up with food, but in fact, sunny summer months are when men eat more calories – unlike women.

The effect seems to occur because sunlight makes the skin release an appetite-stimulating hormone, says Carmit Levy at Tel Aviv University in Israel.

Levy and her colleagues noticed the effect in experiments in mice, in which male animals exposed to UV light ate more food.

To see if humans do the same, the team used data on about 3000 people who had filled in questionnaires as part of the Israeli government's national health and nutrition survey. Between March and September, the men consumed about 1.7 per cent more calories per day than they did during the rest of the year, while the women's food intake stayed about the same.

Human appetite is influenced by many complex systems, but a substance called ghrelin seems to be the only hormone that directly stimulates eating. It was thought to be mainly secreted by the stomach when empty. "It tells the brain to eat more," says Caroline Gorvin at the University of Birmingham, UK.

Further investigation revealed that exposing male mice to UVB radiation, which is present in sunlight, raised levels of ghrelin secretion by fat cells in their skin. This was blocked by the female sex hormone oestrogen, which may explain why the effect wasn't seen in the female mice or the women.

Boosted ghrelin secretion was also seen in men's skin samples that were exposed to UV light in the lab (*Nature Metabolism*, doi.org/h4st).

Skin hasn't previously been thought to play a role in appetite, says Gorvin. The reason for the effect is unclear, but it may be an adaptive response to fuel greater physical activity in summer, says Levy. ■

## Space

# The chance falling rockets will hit someone is increasing

Jonathan O'Callaghan



TPG/GETTY IMAGES

PIECES of rocket falling uncontrolled back into our atmosphere may cause casualties, unless action is taken to limit the risk they pose.

The number of rockets launched annually has been steadily increasing, with 135 successfully going up in 2021, a record for a single year. Many launches involve discarding part of the rocket after it boosts any satellites it is carrying into a desired orbit. The rocket parts often then fall back to Earth, and more than 1000 rocket bodies are estimated to have uncontrollably re-entered the atmosphere in the past 30 years.

Much of this debris falls in the ocean, which covers more than two-thirds of Earth's surface, but some hits things on land.

In May 2020, a 12-metre-long pipe suspected to originate from a Chinese rocket fell in a village in the Ivory Coast. In April 2022, another piece of debris reported to come from a Chinese rocket landed near a village in India. Wreckage of a Chinese Long March rocket also landed in Guizhou, China, in December 2014 (see picture).

Now, Michael Byers at the University of British Columbia in Canada and his colleagues

have calculated the danger that such falling debris poses. They say there is a 10 per cent chance of one or more casualties being caused by falling debris over the next decade, and the risk is disproportionately higher in low-income nations near the equator, where population densities are higher and more debris tends to fall because more rocket bodies travel over the equator (*Nature Astronomy*, doi.org/gqg6pz).

**"I have no doubt there will be a serious incident: hurting somebody or damage to property"**

"We think this has to stop," says Byers, who wants rocket companies to be told to keep leftover fuel to target safe re-entries over uninhabited ocean regions. "We have modern rockets that can avoid uncontrolled re-entries, rather than playing Russian roulette with the Ivory Coast and India. Who's to say the next piece won't come down in central Mumbai?"

Jonathan McDowell at the Harvard-Smithsonian Center for Astrophysics says rocket stages discarded in orbit are

**Parts of a rocket that fell in Guizhou, China, in 2014**

a large problem. "When you have stages left in orbit, there's a collision risk," he says. Such stages can also explode because of fuel left on board. "The only way to make sure your rocket isn't going to blow up is to de-orbit it," says McDowell.

If rocket debris does cause damage or casualties on Earth, Ram Jakhu at McGill University in Montreal, Canada, says legal action can be taken under the United Nations's Liability Convention of 1972. Only one such case has been seen before, when Canada was awarded CAN\$3 million (US\$2.3 million) from the Soviet Union in 1981 after a Soviet satellite crashed in the country in 1978, but the convention could be used again.

"I have no doubt there is going to be another serious incident," says Jakhu. "There's a strong probability of hurting somebody or damage to property."

Some organisations, like SpaceX, can now land the lower part or first stage of their rockets following a launch. Yet second stages – used to boost satellites into their final orbits – are still regularly left to drift in space, often because they carry the precise amount of fuel to do their job rather than leaving some for a controlled return.

SpaceX and the China National Space Administration didn't respond to a request for comment.

"The goal is to have international agreement to phase out uncontrolled re-entries," says Byers. "Some older rocket designs may need to be put out of service or modified." ■