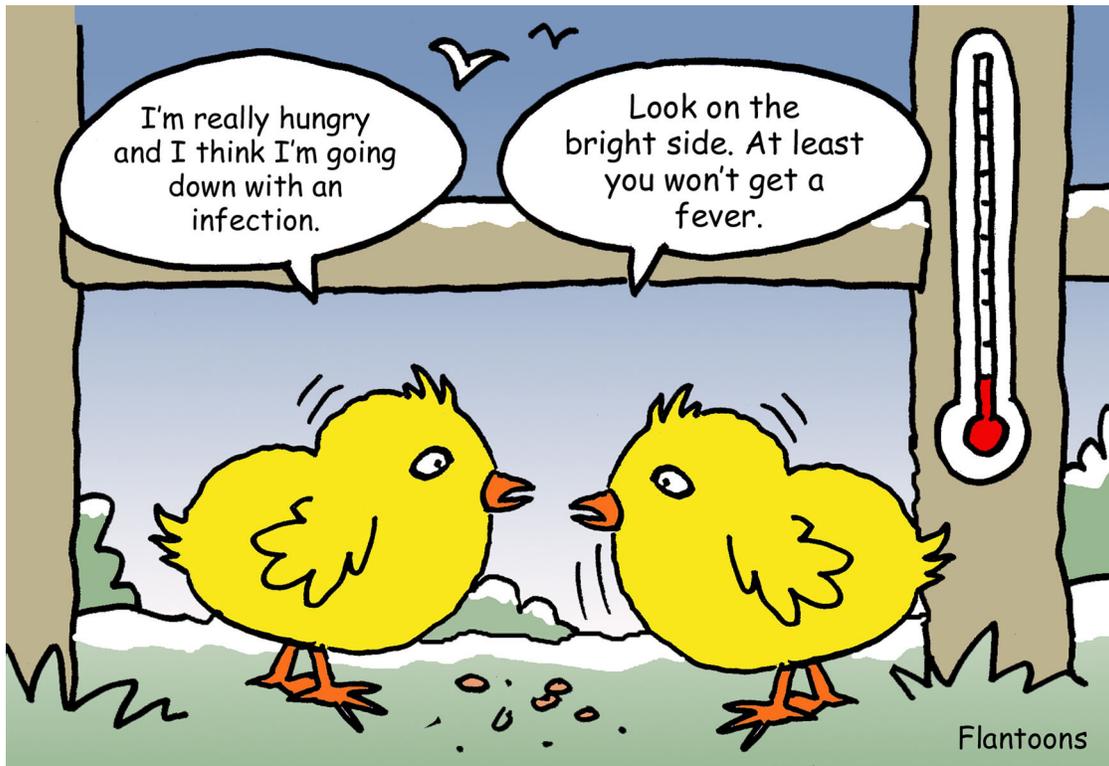


INSIDE JEB

Chilly hungry chicks forego fever to save energy



As we continue working our way through the Greek alphabet of coronavirus variants, fever is still amongst the top symptoms heralding an infection. But running a high temperature is costly and some creatures, including ourselves, are unable to produce a fever when exhausted. But Lara do Amaral-Silva and colleagues from São Paulo State University, Brazil, wondered whether there was more to it than animals simply running out of energy. Might birds give fever a miss to conserve energy when their metabolism is already stretched? Some birds drop their body temperature to reduce energy consumption or when stocking up to migrate, so the team checked out how cold peckish chicks coped when they experienced a fake infection to find out whether they forego fever when needs must.

Carefully injecting a tiny radio-transmitter thermometer into the abdomens of 2 day old chicks to monitor their body temperature, the team waited until the birds were old enough to hold a

stable temperature and then injected the youngsters with a fake infection – a component of infectious bacterial cells that could do the chicks no harm but would trigger a fever – and then measured how the youngsters coped with fighting the simulated infection when warm and well fed, warm but hungry, cold and well fed and, finally, cold and hungry.

Not surprisingly, the chicks that were well fed and warm began developing a fever (0.5°C) 3 h after their injection, although their temperature initially fell slightly (by 0.5°C during the first 2 h) as their metabolism also dipped. However, the temperature of the hungry chilly chicks plummeted by $\sim 2^{\circ}\text{C}$ during the first hour after the injection, before gradually increasing. Even after 6 h, their temperature was still $\sim 0.5^{\circ}\text{C}$ lower than normal. In fact, the cold hungry chicks were directing more blood to the skin and panting, to allow more heat to escape the body, in addition to avoiding huddling with their nest mates to keep warm.

Instead of producing a fever, they were actively making themselves colder.

However, when the team checked whether the chilly hungry chicks were capable of increasing their metabolism to fight an infection – by injecting them with a drug that increases metabolism – the youngsters had energy to spare; they could have raised a fever if they wished. In short, the cold hungry chicks were actively suppressing their ability to produce a fever to conserve energy when conditions were harsh, as the cost of fighting an infection by turning up the heating outweighs the benefits for chicks on a tight energy budget.

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