

Experts discover why Rudolph's nose is red

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Rudolph's nose is red because it is richly supplied with red blood cells which help to protect it from freezing and to regulate brain temperature.

This superior "nasal microcirculation" is essential for pulling Santa Claus's sleigh under extreme temperatures, reveals a study in the Christmas issue published on *BMJ* website today.

Tiny blood cells (known as micro-vessels) in the nose are vital for delivering oxygen, controlling inflammation, and regulating temperature, but few studies have assessed their function in detail.

Knowing how important this regulation is for flying reindeer, who have to deal with extremes of temperature while pulling a sleigh, researchers in the Netherlands and Norway set out to test whether Rudolph's infamous red nose was due to "a highly dense and rich nasal microcirculation" compared with human noses.

Using a hand-held video microscope, they first assessed the noses of five healthy human volunteers and found a circulating blood vessel density of 15 mm/mm².

When the technique was applied to two reindeer noses, the researchers found a 25% higher density of blood vessels, carrying a super-rich concentration of [red blood cells](#).

They also found a high density of mucous glands scattered throughout the reindeer noses, which they say helps "maintain an optimal nasal

climate during changing [weather conditions](#) and extremes of temperature as well as being responsible for [fluid transport](#) and acting as a barrier."

Infrared [thermal images](#) showed that reindeer do indeed have red noses.

"The microcirculation of the nasal mucosa in reindeer is richly vascularised and 25% denser than that in humans," say the authors.

"These factors explain why the nose of Rudolph, the lead flying reindeer employed by Santa Claus to pull his sleigh, is red and well adapted to carrying out his duties in [extreme temperatures](#)."

Provided by British Medical Journal

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