

Natural heat pack in dog's foot pad

A JAPANESE scientist may have found the answer to how dogs can walk barefoot in the snow – an internal central heating system.

The secret lies in how dogs circulate their blood to prevent cold surfaces from chilling the rest of their bodies, according to Hiroyoshi Ninomiya, a professor at Yamazaki Gakuen University, just west of Tokyo.

The system uses warm, oxygenated blood to heat the cold blood that has been in contact with a cold surface before returning it to the dog's heart and central circulation.

"Dogs exchange heat at the end of their legs. Arterial blood flows to the end of their legs and then heats up venous blood before returning it to the heart," Ninomiya said of his findings, published in the journal *Veterinary Dermatology*.

"In other words, they have a heat exchange system in their feet."

Ninomiya studied a preserved dog's leg under an electron microscope and

found that because of the proximity of arteries and veins in the foot pad, the heat in the blood carried from the heart to the arteries is easily conducted to the cooler blood in the veins.

This heat transference maintains a constant temperature in the foot pad, even when exposed to extremely cold conditions.

Dogs are not alone in having this sort of heat exchange system, which is shared by other animals such as dolphins, Ninomiya said.

But not all dogs thrive in the cold, due to refining by breeders seeking specific traits, he added. "Dogs evolved from wolves, and so they still have some of that ancestry remaining. But that doesn't mean that one should always go and drag a dog around in the snow all the time.

"There are many varieties of dogs nowadays that are not able to stand the cold."

– Reuters

