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EFFECT OF ETHANOL ON HEAT TOLERANCE

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Brown adipose tissue (BAT) is the most important organ generating heat in small mammals adapted to cold. Although shivering is the mechanism by which human adults, who do not possess normally brown adipose tissue generate heat in the cold, BAT has also been found to develop in people, who spend much time outdoors, such as outdoor workers and skid row alcoholics. A previous study by us showed that chronic alcohol intake increases the oxidative capacity of BAT in the rat, as does prolonged cold exposure. Long-term alcohol consumption was also found to induce BAT-like characteristics in the adipose tissue around the thoracic aorta and common carotid arteries in the human being.
The purpose of this study was to elucidate the effect of a large dose of ethanol on heat tolerance in alcohol-fed rats. In Finland, most of those who die in the sauna do *so* under circumstances in which they have consumed alcohol for a long time, and are inebriated at the time of death.

The rats were housed at a room temperature of 20°C for four months and divided into two groups. The first group received water ad lib and the second group water containing 10% ethanol. After four months the rats were given ethanol (2 g/kg) i.p. and exposed to a warm room (33°C) for one hour.

Alcohol increased the core temperature of the controls **by** 0.2°C, whereas the core temperature of the alcohol-fed rats rose 0.5°C. Blood alcohol level of the alcohol-fed rats was **1.7** o/oo after exposure of one hour and in the controls 2.2 o/oo. Chronic alcohol intake had increased the relative weight of brown adipose tissue and protein, and noradrenaline content in the adipose tissue, compared to the controls, allowing an enhanced capacity for heat production.

It could be possible that ethanol attenuated heat tolerance in the alcohol-fed rats, triggering heat production in BAT, whose thermogenic activity was increased.