The effect of alph ar-adrenocePlor stimulation with guanfacin on thermdgenesis in fasted and fed sheep

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Abstract:

Eight sheep with an average body weight of 99 kg were divided into two groups (fasted and fed) of four and kept in individual pens. The sheep were used to examine the effects of alpha"-adrenoceptor stimulation on heat production, heart rate, rectal temperature, skin temperature and plasma parameters. On the day of the experiment, food but not water was withheld from the fasted group and the fed group_received 1.0 kg of pelleted alfalfa diet. The treatments consisting of vehicle (saline) and three levels (1ow=0.8 mg; medium = 1.6 mg; high = 2.4 mg per sheep) of guanfacin were administered intravenously in a split-plot experimental design. The heat production was determined by open circuit respiration calorimetry, the heart rate was recorded by an electrocardiograph and the rectal and skin temperatures were measured with a Fisher Digital Thermometer. When compared to saline, guanfacin reduced ($P < 0.05$) the heat production of fasted sheep (1.21 vs. 0.99, t.-OS, O.SS W kg-1) for the low, -idio- and high doses, respectively. For the fed sheep the medium and the high doses reduced total.post-feeding heal production (1.64 vs. 1.43,1.i5 W kg-l). The difference in heat production between the fed and fasted animals was not altered by guanfacin. The skin temperature was reduced by all doses of guanfacin in the fasted sheep but only by the high dose in the fed sheep. The heart rate was not affected by guanfacin. The high dose increased the rectal temperature of fed sheep. In both groups the high dose resulted in a decrease ($P < 0.05$) in blood haemoglobin content. Guanfacin induced a two- to threefold increase in plasma glucose and a transient response in insulin concentration. We conclude that shortterm alphar-adrenoceptor stimulation with guan-facin suppresses the heat production of both fasted and fed sheep but has no effect on the heat increment of feeding.

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