



## Effect of epinephrine and cortisol on fasting-induced ghrelin secretion in male rats fed different levels of their energy requirement

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### Abstract

**Introduction:** ghrelin is a potent orexigenic agent in rodents and humans. Some studies have shown that ghrelin participates in the adaptive response to weight loss and plasma concentration of ghrelin rises with dieting. On the other hand, weight loss and fasting is accompanied by increased levels of epinephrine and cortisol. In this study, we investigated the effects of epinephrine and cortisol on fasting-induced ghrelin secretion in rats fed different levels of their energy requirements.

**Methods:** forty five male Wistar rats (300-350 g, 15 per group) were fed a diet containing 100%, 50% and 25% of their energy requirement for 10 days followed by 2 days of fasting. Animals were then anesthetized for carotid artery cannulation, which was used for injections and blood samplings. Rats received either 3 µg epinephrine (Ep)/Kg BW, 3 µg cortisol (Cor)/Kg BW, or a combination of these two (0.1 mg in 1 ml of PBS). Blood samples were collected before injections and 30, 60, and 120 min after injections.

**Results:** mean plasma concentration of baseline ghrelin increased in the animals fed 50% food restriction ( $P \leq 0.01$ ). In 100% and 50% food restricted groups, fasting ghrelin levels fell after epinephrine and combination of epinephrine and cortisol injection ( $P \leq 0.05$ ). In contrast, the group that had 25% food restriction did not show any response to epinephrine and combination of epinephrine and cortisol ( $P > 0.05$ ), while the levels of the fasting ghrelin rose significantly after cortisol treatment ( $P \leq 0.01$ ).

**Conclusion:** These results indicate that injection of epinephrine suppresses starvation-induced secretion of ghrelin in normal (100%) and starved (50%) rats. Ghrelin secretion response to epinephrine might be affected by weight loss as it does not seem to be suppressed in starved (25%) rats.

**Key words:** Ghrelin, Cortisol (Cor), Epinephrine (Ep)

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