DAILY RHYTHMS OF SERUM LEPTIN IN EWES: EFFECTS OF FEEDING, PREGNANCY AND LACTATION

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The aim of the present study was to test whether serum concentrations of leptin in ewes vary with a daily rhythm. For this purpose, we examined 24 h serum leptin profiles of ewes exposed to natural photoperiodic conditions and subjected to two different feeding schedules (regular feeding and fasting). The results show for the first time the existence of daily rhythm of plasma leptin in regularly fed ewes, with a minimum during the light phase and a peak during the dark phase. Daily rhythms of serum leptin persisted after 50 h of fasting, although fasting shifted the peak of the rhythm to the beginning of the light phase and significantly reduced daily leptin production. To gain a better understanding of the role of leptin in the temporal organization of physiological events related to pregnancy and lactation, we measured serum leptin profiles throughout 24 h in ewes either during pregnancy or lactation. Daily leptin rhythms were found to persist during pregnancy and lactation, but both physiological conditions altered leptin concentrations. Maternal serum leptin concentration rose between early and mid pregnancy, then decreased in the late pregnancy and during lactation. Daily serum leptin concentration was significantly lower in nonpregnant, nonlactating ewes, compared either to lactating or to early pregnant ewes.

Keywords Leptin, Circadian, Feeding, Pregnancy, Lactation

INTRODUCTION

Leptin (from the Greek leptos, meaning thin) is a protein hormone with important effects in regulating metabolism and reproductive functions. The leptin gene (ob) was identified in mice by positional cloning, and its