Stressful situations modify energy intake and expenditure and may provoke either weight loss or gain. To better understand mechanisms mediating stress-induced obesity, we developed a monkey model of social subordination that altered food preferences and led to overeating in subordinate monkeys. To the extent that social subordination in monkeys and low socioeconomic status in humans represent parallel experiences, our monkey model explains in part why obesity tracks with low socioeconomic status in humans. In contrast, in monkeys, energy deficiency elicited by undernutrition combined with increased energy expenditure synergized with social stress to compromise ovulatory function. Similarly, in women, energy expenditure acutely amplified hypercortisolism more in those with FHA (functional hypothalamic amenorrhea/stress-induced amenorrhea) than in eumenorrheic women. While FHA reported attitudes such as perfectionism and high drive for thinness that curb eating, attitudes associated with overeating remain to be better characterized. We posit that obesity and stress are linked because the neurobiologic reward of overeating constrains hypercortisolism. In conclusion, reproductive consequences of energy deficiency and excess are distinct. Modest undernutrition associated with stressful circumstances causes anovulation and infertility by suppressing GnRH drive. In contrast, overnutrition and obesity only modestly compromises fertility yet markedly increase the risk of poor obstetrical outcomes.