Leptin Up-Regulates the Lactogenic Effect of Prolactin in the Bovine Mammary Gland In Vitro. By Feuermann et al., page 4183. Leptin has the ability to up-regulate the action of prolactin in the mammary gland. We investigated the effect of leptin and prolactin on bovine mammary gland explants. Leptin enhanced the effect of prolactin on cell proliferation, on transportation of amino acids to the udder, and on protective protein production, and it down-regulated cell death. Leptin plays an important role in mammary gland lactogenesis.