Hot-iron branding is painful, but little is known about the duration of pain and how best to control it. We quantified tissue sensitivity and healing in branded and unbranded cattle. We also considered the effects of a single injection of flunixin; a possible method of mitigating pain in the hours after the procedure. Calves (126d; 112kg) were hot-iron branded and allocated to 1 of 4 treatments: branded with or without flunixin (IV, 1.1 mg/kg) and unbranded with or without flunixin (n=12/treatment). Wound sensitivity was assessed by applying a known and increasing force with a von Frey anesthesiometer in the center of the brand (or equivalent area in non-branded treatments) until animals responded. Healing was measured with a 6-point scale (1=fresh brand, 6=no scabbing and fully re-pigmented). These measures, along with weight gain and surface temperature, were recorded 1, 2, 7, 14, 21, 28, 35, 42, 56 and 71d after branding. Branded calves were more sensitive than non-branded (P≤0.003). This difference was most pronounced immediately after branding (e.g. d7, Brand:113±36 vs. No-brand:449±23 g force), but persisted until d71 (Brand:380±/-37 vs. No-brand:453±/-23 g force). Brands required a minimum of 8wk to fully heal. Flunixin had no effect on sensitivity, surface temperature or healing. In summary, brand wounds require at least 8wk to heal and remain painful for at least this long; a single injection of flunixin had no measurable effect in mitigating branding pain.