

Table 4 Comparison of specific behavioural responses (increase, decrease or no change) of goat kids and calves *following* cautery disbudding. The group that is compared to cautery disbudding and the observation duration of each study is also presented. Note: when the cautery disbudded animals are treated (eg with lidocaine), this is denoted by a superscript located in the comparison group column and is described in the footnote.

Species	Head shake	Head rub	Head scratch	[^] Stand/lie bouts	Feed	Groom	Mouth movement	Ear flick	Kick/buck	Comparison group	Observation duration	Reference
Goat kids	+									Simulated disbudding	3 h	Greenwood & Shutt (1990)
	+*		N	+*	N		+*			Disbudding + meloxicam	2 h/day for 4 days	Ingvast-Larsson <i>et al</i> (2011)
				+	+	+	+			Disbudding + lidocaine	5 h over 24 h	Chandrabhas <i>et al</i> (2013)
	+	+	+		N	N	N			Simulated disbudding	12 h	Hempstead <i>et al</i> (2017)
	+		+	N	N	N				Simulated disbudding	24 h	Hempstead <i>et al</i> (2018a)

	N		N	N	N	N			Simulated disbudding	1 h	Hempstead <i>et al</i> (2018c)
	+	-	+	+		-			Disbudding + lidocaine	Up to 24 h	Morisse <i>et al</i> (1995)
	+	N				-			Simulated disbudding	4 h	Graf & Senn (1999)
	+						+	+	Simulated disbudding + lidocaine	4 h	Grondahl-Nielsen <i>et al</i> (1999)
Calves	+	+		N	N	N	+		Disbudding + ketoprofen ^a	2.5 h over 24 h	Faulkner & Weary (2000)
	+	+		+					Caustic paste disbudding + xylazine ^b	12 h	Vickers <i>et al</i> (2005)
				N	N	N			Simulated disbudding+ lidocaine ^c	72 h	Doherty <i>et al</i> (2007)
					N	N		+	Simulated disbudding	40 min	Stewart <i>et al</i> (2008)

+*	+*		N	N	N	+	Disbudding + lidocaine + ketoprofen ^d Simulated	7 h	Duffield <i>et al</i> (2010)
+	N		+			+	disbudding + saline + lidocaine ^e	20 min over 1 h	Stilwell <i>et al</i> (2010)
+	N			N		+	Disbudding + meloxicam + lidocaine ^f	10 h over 48 h	Heinrich <i>et al</i> (2010)
			-				Disbudding + meloxicam ^c Simulated	7 days	Theurer <i>et al</i> (2012)
	N					-	disbudding + saline ^c	24 h	Mintline <i>et al</i> (2013)
	N					N	Simulated disbudding ^g	15 min	Caray <i>et al</i> (2015)
N	N	N	N		N	N	Simulated disbudding + lidocaine +	1 h over 24 h	Mirra <i>et al</i> (2018)

					xylazine + meloxicam ^h		
			-		Simulated disbudding	24 h	Sutherland <i>et al</i> (2018a)
+	N	N		N	Simulated disbudding	3 h	Bates <i>et al</i> (2019)
					Disbudding + Tri-Solfen		
-		-			meloxicam + lidocaine ^f	24 h	Cuttance <i>et al</i> (2019)

+: increased in response to disbudding, -: decreased in response to disbudding, N: no change in response to cautery disbudding, blank: was not assessed. [^]Refers to the number of transitions between standing and lying. *No differences in individual behaviours were observed, but behaviours were combined together to give a single measure of activity. ^aBoth cautery disbudded and control animals were administered xylazine and lidocaine. Cautery disbudded calves were administered ^bxylazine and lidocaine, ^csaline, ^dlidocaine and saline, ^exylazine and saline, ^flidocaine and a placebo solution, ^gketoprofen, or ^hxylazine, lidocaine and meloxicam.