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Aspects of assessing pain during disease and operations in farm animals

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The terms welfare, health, stress and pain are the same concepts whether we are considering a person, a calf or a trout. This point has been emphasised by many animal welfare scientists and is one of the messages of "one welfare"[1]. The welfare of an individual is its state as regards its attempts to cope with its environment[2] and pain is an aversive sensation and feeling associated with actual or potential tissue damage[3].

Whilst welfare ranges from very good to very poor, most people focus on the various forms of suffering when considering our obligations towards the animals that we keep. The problem often expressed in relation to pain in species other than man is that the animals cannot tell you when they are in pain or how bad it is. The major method used in human pain studies is self-reporting, for example on a scale from no pain to very severe pain. This method can be unreliable because people can lie or deceive themselves in relation to pain. Perhaps measures of observed behaviour or physiological change in people, like those used in non-human studies, will in future be considered more accurate than human reporting.

Some people think that pain is a feeling limited to humans, or to mammals, but many studies of anatomy, physiology and behaviour show clearly that pain systems are very similar in all vertebrates, cephalopod molluscs and decapod crustaceans[4,5]. There are variations in the area of the brain that does the pain analysis but little variation in the function. A further misconception is that animals such as cattle do not feel pain because they have thick skin. The simple observation that cattle react to individual mosquito bites demonstrates that the skin thickness does not prevent responses to painful stimuli. Thicker skin can reduce the likelihood or extent of abrasions following some contacts but the nociceptive cells under the skin function fully in animals like cattle.

Sophisticated behavioural measures are being used more and more in studies of pain. However, there are problems in pain recognition which make comparisons between species difficult. Severe pain can exist without any detectable sign. For example, a major response of rabbits that are in pain is inactivity[6]. Individuals within a species vary in the thresholds for the elicitation of pain responses and species vary greatly in the kinds of behavioural responses that are elicited by pain. Hence it is important to consider which behavioural pain responses are likely to be adaptive for any species that is being considered. Humans, like other large primates, dogs and pigs, live socially and can help one another when attacked by a predator. Parents may help offspring and other group members may help individuals who are attacked or otherwise in pain. Hence, distress signals such as loud vocalisations are adaptive when pain resulting from an injury is felt. Those species which can very seldom collaborate in defence, like the smaller ruminants, do not have obvious responses to pain as these are maladaptive. However, subtle changes in facial expression can be useful indicators of pain, for example in rabbits, rodents, sheep, goats and horses[7,8]. The sheep pain facial expression scale involves scoring five facial areas; orbital tightness, cheek tightness, ear position, lip and jaw profile, and nostril and philtrum position. Sheep with footrot, mastitis, or pregnancy toxaemia showed grimace responses and other indicators of pain. When farm ruminants are in pain because of farm operations, the increased cortisol production and an increased occurrence of a range of pain-related behaviours[9,10,11,12,13] can be quantified. For example, pain-related behaviours in calves include: head-shaking, ear-flicking, head-rubbing, inert lying, alterations in gait, amount of walking, licking scrotum, lifting hind leg, abnormal lying, rapid transitions between behaviours and reluctance to go to the food trough. Measures of brain activity can also be used[14] and pain can be prevented using anaesthetics and analgesics[15]. For the general public, pain prevention during farm animal operations such as castration and disbudding is demanded more and more, whilst most people think that more extreme operations like mulesing should be illegal. Consumers refuse to buy specific animal products unless pain is prevented and good welfare guaranteed.

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