

Does reduction of fearfulness tend to reduce pessimistic-like judgment in lambs?

Alexandra Destrez^{a,*}, Véronique Deiss^a, Catherine Belzung^b, Caroline Lee^c, Alain Boissy^a

^a INRA UMR 1213 Herbivores, F-63122 Saint-Genès-Champanelle, France

^b INSERM UMR 930, Université François-Rabelais, Tours, France

^c CSIRO Livestock Industries, Locked Bag 1, Armidale, NSW 2350, Australia

ARTICLE INFO

Article history:

Accepted 5 April 2012

Available online 24 April 2012

Keywords:

Welfare

Fear

Judgment bias

Optimistic-like

Diazepam

Sheep

ABSTRACT

Recent studies emphasize the role of interactions between emotions and judgment of environment to better assess affective state in animals. Diazepam offers a way to pharmacologically manipulate the affective state. This drug is generally used to reduce negative affective states, mainly by reducing fearfulness. Here we investigated whether a reduction of fearfulness through a pharmacological approach could reduce pessimistic-like judgment in lambs. We tested the effects of diazepam (0.10 mg/kg), a benzodiazepine known for its anxiolytic properties in many species, in 5-months old female lambs submitted to two experiments: the first one to assess their fear-related reactions (cortisol, cardiac and behavioural measures) to isolation and suddenness tests, and the second one to assess their putative judgment bias. In experiment 1, the lambs treated with diazepam were less frightened by isolation and suddenness than the control lambs injected with vehicle, which tended to confirm the anxiolytic effect of diazepam on sheep. In experiment 2, the lambs were first trained to perform a spatial location task to test for judgment bias in sheep. This task required a go/no-go response according to the location of a bucket in a pen, with one location being reinforced positively (with a feed reward) and the other negatively (with a fan-forced blower). Once trained, lambs ($n = 16$) were exposed twice (10 min and 3 h after injections) to five consecutive bucket locations: the two learnt locations plus three unrewarded, ambiguous locations set between the learnt locations. Control lambs increased their latency to approach one of the ambiguous bucket locations ($P < 0.05$), while treated lambs maintained the same latency to approach this location. This difference may reflect a bias in judgment in relation to fearfulness: treated lambs seemed to display a more positive judgment of an ambiguous event than control lambs. Reduction of fearfulness may thus induce a more positive affective state but this requires further investigation, with additional studies comparing the efficacy of the cognitive bias approach to other measures of affective state.

© 2012 Elsevier B.V. All rights reserved.

1. Introduction

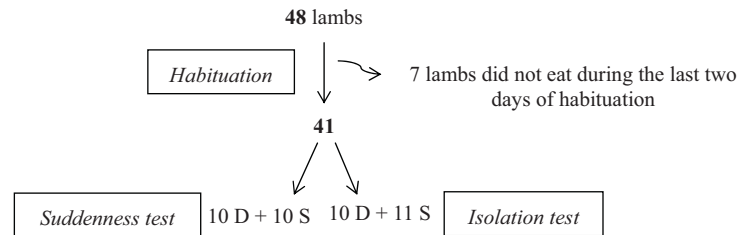
Animals have the ability to experience emotions i.e. brief affective reactions (Paul et al., 2005). Recent studies emphasize the role of interactions between emotions

and cognition to better assess welfare in animals (Desire et al., 2002; Paul et al., 2005; Boissy et al., 2007; Mendl et al., 2009). Here, cognition is defined as “mechanisms by which animals acquire, process, store and act on information from the environment” (Shettleworth, 2001). As originally shown in human studies (see for review Scherer, 1999), there is growing evidence that emotions in animals result from cognitive processes of appraisal based on elementary characteristics of a situation, from the simplest

* Corresponding author. Tel.: +33 473 62 40 94; fax: +33 473 62 41 18.
E-mail address: alexandra.destrez@clermont.inra.fr (A. Destrez).

D = Diazepam
S = Saline

Experiment 1. Effect of diazepam on fearfulness



Experiment 2. Effect of diazepam on judgment bias

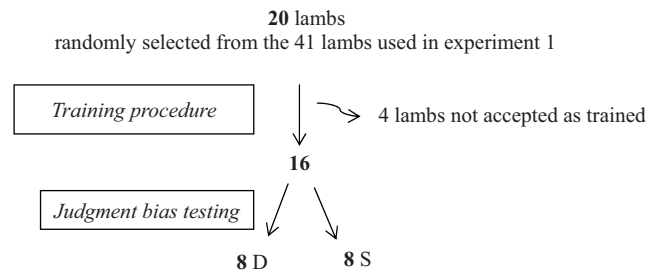


Fig. 1. Allocation of animals used in fearfulness and judgment bias tests. During judgment bias test, half of diazepam-treated animals and half of control animals had already received diazepam in fearfulness tests one month before.

(e.g. suddenness) to the most complex (e.g. controllability of an event). In turn, emotions can influence cognitive functions such as attention and mnemonic capacities by biasing environment perception, as widely shown in human psychology (see for review Clore and Huntsinger, 2007; Clore and Palmer, 2009; Lanteaume et al., 2009). For example, sad people were reported to make more negative judgments of ambiguous facial emotion expressions than happy people (Lee et al., 2008). Affective state disorders such as depression are also associated with both mnemonic deficits (explicit verbal and visual memory) and executive impairment (see for review Austin et al., 2001). People with depressive disorders exhibit a specific attention bias toward negative emotional cues (words, images and faces) and pay less attention to positive stimuli (Eizenman et al., 2003; Leppänen et al., 2004; Dai and Feng, 2011).

Experiments in laboratory animals and more recently in farm animals suggest that cognitive biases may be valuable indicators of animal affective states (Burman et al., 2008, 2009; Doyle et al., 2009). Furthermore, such biases in animals could help to understand how a state of stress-related discomfort develops. For instance, a persistent negative bias in environment perception may induce a negative affective state. Different judgment biases have been induced by environmental manipulations in animal studies. Exposure to long-term negative treatments induced a negative affective state particularly by pessimistic-like judgments in both laboratory animals (Harding et al., 2004; Burman et al., 2009) and farm animals (Doyle et al., 2010b). A few studies also report that an enriched environment may result in more positive or optimistic-like judgments in mammals (rats: Burman et al., 2008; dogs: Burman et al.,

2011) and in birds (Matheson et al., 2008). However, there is still a lack of information on affective states in farm animals.

To manipulate the affective state of animals, it is possible to use a pharmacological approach, such as that of Doyle et al. (2010a) in sheep. These authors showed that depletion of brain serotonin, a neurotransmitter involved in the etiology of major depression, caused pessimistic-like judgment bias. Diazepam, a classical benzodiazepine, also offers a way to pharmacologically manipulate the affective state in animals. Diazepam is generally used to reduce negative affective states: this drug has appeasing properties in various animal species (Hamed et al., 2009; Ibáñez and Anzola, 2009) and reduces fear, anxiety and frustration in cattle (Sandem et al., 2006). This being the case, will reduction of fearfulness (induced by diazepam) reduce pessimistic-like bias in animals? Fearfulness is generally defined as the propensity of an animal to be frightened to some degree following the perception of a danger (Boissy, 1998; Jones and Boissy, 2010).

In the present study, we examined the ability of diazepam treatment to induce a reduction of fearfulness (Experiment 1) which may induce an optimistic-like judgment bias (Experiment 2) in lambs, common small farm ruminants.

2. Methods

The experiments were carried out in accordance with the European Communities Council Directive of 24 November 1986 (86/609/EEC) and were approved by a local ethics committee (CE17-08 CEMEA Auvergne, France).

Download English Version:

<https://daneshyari.com/en/article/6379744>

Download Persian Version:

<https://daneshyari.com/article/6379744>

[Daneshyari.com](https://daneshyari.com)