How well do farm animals cope with their environment during transport?

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The welfare of animals during handling and transport can be assessed using a wide variety of measures which are described. These measures provide information about how much difficulty the animal has when trying to cope with the transport environment and about the extent to which an individual animal fails to cope. Management and housing prior to transport can have a considerable effect on welfare during transport. The effects of management and weather conditions on animals are described. The importance of proper training for staff involved in animal transport is emphasized and other conclusions are listed.

particulars useful as indicators that the animal has encountered a problem. When a pig reaches a dark area in a raceway or when cattle are confronted with sharp shadows or an open side road, they often stop moving and freeze (GRANDIN, 1980 and 1982). If animals are disturbed by a noise or other stimulus they may show a sudden escape response, running and hitting walls or other animals. Both of these behavioural responses give information about the difficulty experienced by the animal as a result of environmental conditions.

Behavioural responses can also give some information about severe effects of physical conditions on animals. For example, panting may occur or if there is evidence that the animal has difficulty when it walks or tries to stand or lie. However, there are many situations where the effects on the animal are extreme but no behavioural response is seen. Some species, e.g. sheep, may be in severe pain but show no behavioural response. These behavioural responses give information about the extent of an animal's problems with its environment but absence of such responses does not mean that there is no problem. This point also applies to all other measures of poor welfare.

The extent to which normal behaviour is shown provides information about the state of an animal. In a recent study of sheep transport (HALL and BROOM, in press), sheep travelled for 16 hours in a lorry, which stopped several times, before rumination was observed. These animals would have ruminated much earlier if they had not been transported so the delay before necessary normal behaviour is shown is an indicator of the magnitude of the effect on the animals.

Aggressive behaviour is often shown when animals encounter unfamiliar individuals. Butting in cattle or sheep, pecking at the head region in poultry, biting at the flanks and neck in pigs, and biting or kicking in horses are all clear signs of aggression. The behaviour indicates that the individual which shows the behaviour has some degree of problem and it often results in problems for the individual to whom the action is addressed.

Tests of behavioural aversion can provide useful information about treatments which result in poor welfare. When animals are hurt or frightened in a place they may remember this and refuse to go back to that place. The effort which they make to try to avoid returning to the place can be measured and used in assessing the extent of aversion which the animal feels and hence the degree of unpleasantness of the event which has triggered the aversion. RUSHEW (1962a, b) drove sheep down a race to a place where they were either gently handled, or subjected to shearing, or electrocution. When taken back to the race, those handled gently went down the race more rapidly on the second occasion. After shearing, the animals were harder to drive down the race and after electrocution they were very reluctant to go down the race, such experimental procedures could be used to assess the likely effects on welfare of many aspects of transport procedures.

Physiological measures

There are very many physiological measures which can indicate the extent to which an animal has difficulty in coping with adversity. Some of these measures will be mentioned here, the first being heart rate.

Heart rate

When pigs were driven using an electric prod, their heart rate increased by a factor of 1.5 and when they had to climb a steep ramp the heart rate was 1.7 times higher than when standing beforehand (VAN PUTTEN and ELSHOF, 1978). Steeper ramps caused greater increases up to a maximum level (VAN PUTTEN, 1982). Some of the change in heart rate is a consequence of increased activity but heart rate can increase during disturbing events in the absence of increased physical activity. In a study of the effects of various handling procedures on sheep, BALDOCK and SIBLY (1990) obtained basal levels of heart rate for various levels of activity and then took account of these when calculating responses to: approach of a strange human, isolation, standing on a trailer, brief transport, etc. (Table 1). In these regularly handled sheep visual isolation and social mixing were more disturbing than transport. It is clean from these and many other studies that records of heart rate, if interpreted carefully, can provide much useful information about welfare during transport procedures.

Body temperature

Body temperature increases in animals which are severely disturbed more than in animals which are less disturbed. Such disturbance may be separation of an infant from its mother (REITE et al., 1981), defeat in a fight (VON HOLST, 1988) or transport (TRUNKFIELD et al., 1991). The measurement of rectal temperature after transport is relatively easy and the measurement of body temperature during journeys is...
Effects of previous housing and management on welfare during transport

Farm animals do not react in an uniform, automatic way to the situations which they encounter during handling and transport.

A horse which is taken frequently to a race track or a show jumping area and which is, as a consequence, familiar with the loading procedure and the vehicle in which it travels, is much less affected by the whole sequence of events during transport than a similar horse which has never before experienced such situations.

Most farm animals, however, experience transport only once or twice during their lives and so the effects on them are much greater than would be expected by the average person, who travels frequently.

One of the most extreme problems during transport for some farm animals is that they have to come into close proximity to humans. The typical broiler chicken is not handled, except perhaps when it is one or two days old, and never comes very close to humans. The hen which lives for a year in a battery cage is normally able to maintain a distance of one or two metres from humans. A pig which has grown to 100 kg weight may not have been touched by a human hand since it was a very young piglet, and, like the chicken, may have been able to maintain a critical, important, minimal distance from humans. As a result of the lack of direct, friendly human contact in most farm animals, there can be a considerable shock when much closer contact occurs prior to transport or slaughter, even if the contact does not result in any pain for the animal. When HEMSWORTH et al. (1986, 1987) spent a short time handling young pigs, these were much easier to handle when older and much less disturbed by handling procedures. Similarly, LE NÉGRE et al. (1982) showed that beef cattle which were handled when very young calves, especially, when newly weaned, were much more amenable to handling at a later age. It is clear that farmers who have to manage animals should take account of such research results and give animals appropriate experience of being handled.

The evidence for adverse effects on beef cattle and pigs when animals which have come from different pens or fields are mixed together, is very clear. KENNY and TARRANT (1987a, b, c) found that mixing bulls or steers from different social groups increased the incidence of fighting, increased the carcass damage and DFD meat defects. Similarly, GUINEY and PRICE (1989a, b) found that skin damage and meat quality were affected when pigs from different pens were mixed prior to transport or at lairage. There was an increase of 7.2% in skin blisters of the kind which result in carcass down-grading so there must be a substantial effect on the welfare of the animals. In order to improve welfare and to minimise carcass damage, the mixing of cattle and pigs with animals from different social groups should be avoided.
is needed and drivers of vehicles should be encouraged to act in any way that may result in the welfare of the passengers. Observing animals during transport requires training. Drivers of transport vehicles need to be much more careful to avoid sudden braking or large lateral movement of the vehicle than drivers of vehicles carrying human passengers. A human who is sitting or standing but holding on to a bar or strap is much better able to avoid being thrown around than a four-legged animal which is standing. Sheep, cattle or pigs which are standing are readily thrown against one another when road vehicles go around corners or aircraft take off. This fact is largely ignored by many of those who drive animal vehicles.

People who load animals on to vehicles and who inspect animals during journeys need training to do this. No person should be allowed to do this job unless properly trained. It should be illegal to employ people to drive animal transporters who have not received training, or who are not registered as in the process of training.

In order to maximise the chances that those who are in charge of animals during transport will act in such a way that the welfare of the animals will be good, those people should receive a financial incentive to treat the animals well. This will not only improve animal welfare but will increase the value of the meat by reducing the frequency of carcass downgrading.

Conclusions

1. Consider handling and transport when designing housing conditions.
2. Give animals experience of human contact to make handling easier later.
3. Avoid social mixing.
4. Handle carefully, avoid painful or damaging methods of moving animals.
5. Provide good loading facilities.
6. Keep stocking density from being too high.
7. Improve vehicle design.
8. Train the people who will be responsible for the animals.
9. Give these people a financial incentive to improve animal welfare and carcass quality.
10. Limit the length of journeys.

References


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