ANIMAL WELFARE DURING LONG DISTANCE TRANSPORT OF CATTLE - FACTS AND PUBLIC PERCEPTION

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Introduction

Animal transport gives cause for concern for several reasons: (1) Transport can cause severe stress in animals entailing poor welfare. (2) Stressful transports may have a negative effect on meat quality. (3) There is the risk of spread of infectious diseases over large distances (HARTUNG et al., 2003). Particularly long distance transports of animals are one of the most emotionally discussed topics in the field of animal protection today, and the transport of slaughter cattle to the Near East Region touched the nerve of the public after some television programmes showed cruelties against animals during unloading in the harbours at destination.

The European Union was challenged to act and issued the Council Directive 91/628/EEC of 19th November 1991 on the protection of animals during transport (1991) followed by several regulations such as the criteria for staging points and the route plan (1997) and standards for long distance road vehicles (1998). The most important details for long distance transports (longer than 8 h in special vehicles) refer to the transport time and the unloading rule for the 24 h resting period. The transport times for cattle are 14 h transport followed by 1 h rest and a second period of 14 h transport. Thereafter, the animals have to be unloaded in the resting facilities of a staging post for 24 h. After reloading the journey can continue in the same pattern.

This paper investigates whether these resting and driving times really protect the animals from poor welfare and meet their physiological needs. Examples are given for heart rate and energy metabolism of transported cattle.

Stressful situations during transport

There is no doubt that transport is an unknown procedure for cattle which can be irritating and aversive. The most aversive factors are loading and unloading, bad handling, inappropriate driving, poor road conditions, too hot or too cold climate, insufficient ventilation, high stocking densities, mixing of unfamiliar groups, deck height, lack of water and food, vibration, vehicle motion and length of the journey. Levels of stress in animals may be measured by physiological (e.g. heart rate, body temperature), biochemical (e.g. cortisol, catecholamines, lactate, creatine kinase) and behavioural (video observations) indicators (BROOM, 2003).

Loading and unloading: In **Figure 1** the mean of the heart rate responses of 12 bulls on a journey of 60 h is shown. High heart frequencies can indicate a status of reduced welfare. High heart rates of more than 150 bpm (beats per minute) were observed during loading and unloading, weighing, shortly after the start of the transport and during blood sampling. During the transport journey the heart rate slowed down to 70 and 80 bpm on the average (MARAHRENS et al., 2003). Therefore the repeated unloading and loading during long distance transports should be avoided. This will also help to reduce the incidence of transport injuries which frequently happen when loading and unloading. Resting, feeding and watering should take place on the vehicle in properly equipped supply stations. It seems to be more adequate to realise welfare than stressful loading procedures.

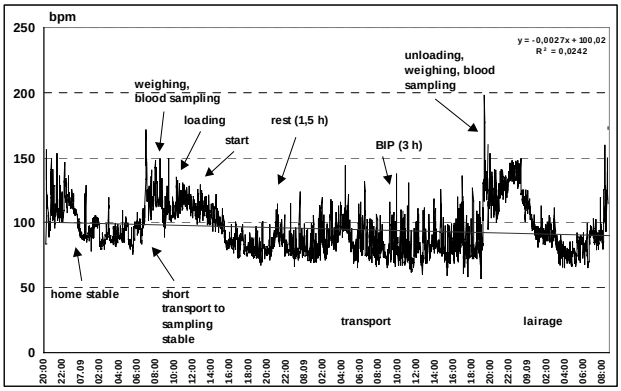

Fig. 1: Means heart rate curve of 12 bulls over 60 hours in home pen, during short term and during long distance transport (from MARAHRENS et al., 2003)

Cortisol is one of the often measured stress indicators. In **Figure 2** cortisol levels in the blood plasma of bulls, steers and heifers before and after transport and after resting time at lairage are given. During collection, weighing and loading the cortisol concentrations increased in the blood of the bulls and steers by a factor of 4 to 5 (40 – 50 ng/ml) above basal values (less than 10 ng/ml in the blood plasma of the male cattle). In heifers cortisol increased by a factor of two only. Steers are usually reared on pastures where they have sufficient physical exercise but not much contact to unknown

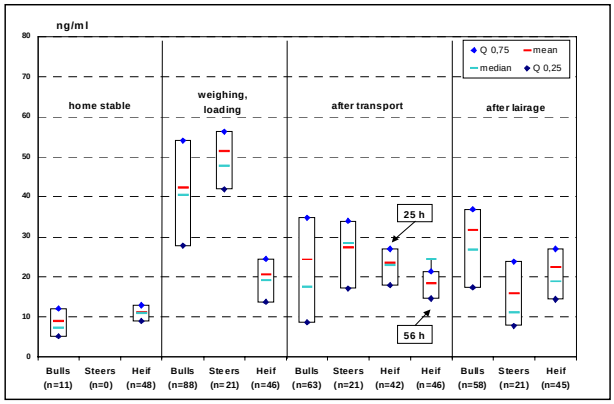

Fig. 2: Cortisol (50 % confidence interval, median, mean) in blood plasma of bulls, steers and heifers before and after transport and after resting time in the lairage

people and strange situations such as handling, weighing and loading. It seems that the increase of cortisol may be an indication of an emotional stress reaction rather than a

physical one. This is supported by the fact that the heart rates were relatively low during loading compared to bulls and heifers (MARAHRENS, 2003, data not shown). After transport and after lairage time the cortisol levels in bulls and steers decreased distinctly. In some steers the concentrations were back to normal ranges. The smallest increase in cortisol was seen in heifers. It looks that heifers become acquainted to the transport with the length of the journey as far as cortisol is concerned. After a transport of 56 h the concentration was lower than after a 25 h transport. The bulls showed the highest concentrations at all sampling points. The high values at the beginning may also be due to the fact that they were transported for 1 to 2 hours from the home farm to the
sampling and loading point in small vehicles.

Resting times: Transport is always a burden and can be energy consuming for the animals. The resting times are designed to give sufficient time to recover. In **Figure 3** the plasma concentrations of non-esterified fatty acids (NEFA) of bulls, steers and heifers before and after a long distance road transport and after the 24 h resting period are shown. NEFA is an indicator of lipomobilisation. In the home pen and during collection, weighing and loading the plasma levels of NEFA in bulls and steers reach about 400 µmol/l, in many of the heifers 700 and 800 µmol/l. In cattle, concentrations of NEFA up to 600 µmol/l are considered "normal". The lipomobilisation in the heifers is distinctly higher. The differences may reflect different feeding regimes in the home farm or high energy expenditure or an insufficient supply during the transport. Fattening bulls are usually fed ad libitum, their energy supply is high and their fat tissue is involved in energy metabolism only to a small

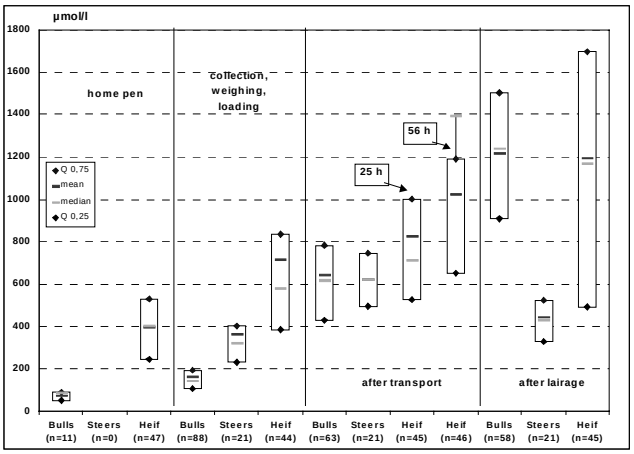

Fig. 3: NEFA (50 % confidence interval, median, mean) in blood plasma of bulls, steers and heifers before and after transport and after resting time in the lairage

extent. The same is more or less true for steers. Pregnant heifers, however, are fed restrictively, especially in the last months of pregnancy, to avoid parturition paresis. In this case the energy reserves (carbohydrates) in the muscles are low and more energy is mobilised from the fat tissues. The longer the journey lasts the higher is the mobilisation rate in heifers. The bulls and steers seem to have quickly available sufficient energy reserves. The picture changes after the resting period of 24 h. Some of the heifers recover but a large number tends to a ketotic metabolism which is also confirmed by high plasma levels of ß-hydroxybutyrate (MARAHRENS et al., 2003, data not shown). Similar high energy expenditure is observed in bulls when kept in resting areas for 24 h without mounting prevention. The steers seem to be able to recover quickly. It was observed that, in contrast to the bulls, they calmed down and consumed roughage and water soon after penned in the lairage.

Conclusions and Recommendations

These few results show that transport of cattle need not to be a serious stressful experience for the animals if the nature and needs of the animals are sufficiently taken into account. For this purpose the present transport directive should be amended according to the needs of the animals.

Loading and unloading in staging posts is stressful for all cattle and should be abolished. During the transport journey stress indicators such as heart frequency are tending towards normal values. However, the welfare can become poorer as journey length increases particularly when the food energy supply is insufficient. Heifers in particular tend to develop an energy deficit in long distance transports. Therefore, it seems useful to supply some energy rich feed during the breaks. For this purpose, the resting time after the first 14 h transport period should be extended from 1 to at least 3 h to give sufficient time for feeding and watering.

For bulls transport is less stressful than resting in lairages when fighting and mounting cannot be avoided. In that case, bulls should be transported as gently and as fast as possible to their destination avoiding long breaks.

Steers recover very quickly after transport when given the opportunity to eat.

The welfare of bulls, steers and heifers is limited by their needs not by a fixed maximum transport time, if vehicle and transport conditions are appropriate. The adaptation of transport schemes to the needs of the animals is necessary. Further improvements should also include an intensified education of handlers and drivers in animal welfare (pay for gentle driving not for speeding), better monitor systems for driving conditions, climate etc. and a more comfortable suspension and vehicle body design.

Last but not least is it necessary to inform the public about the progress made in animal friendly transport schemes and ask for their support.

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