

The effect of various handling strategies on the welfare of dairy cattle

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Introduction

It is well recognised that lactating dairy cows are highly stressed animals in terms of their metabolic demand for a high plane of nutrition (McDonald et al, 2002). However, mental stress caused by aversive stimuli is relatively poorly recognised. This essay will address the issue of mental stress in dairy cattle by examining the results of three studies that have investigated the way in which cattle react to a variety of handling techniques.

Discussion

A study conducted by Pajor et al (2003) was designed to determine whether cattle find certain handling stimuli desirable or aversive. This was done by sending groups of individual cows and heifers through a Y-maze several times. On one side of the Y-maze, cattle were handled in one way and on the other side, a different stimulus was presented. Cows were then allowed to choose which side of the Y-maze they preferred. Four series of experiments were conducted. The first experiment compared cow preference to both pail feeding (an assumed positive stimulus) and hitting and shouting (an assumed aversive stimulus) versus a control (no additional stimulus) to initially demonstrate that cattle are capable of making a choice based on experience ($P < 0.001$). Although reasonable assumptions, this process was limited by the fact that anthropomorphism had to be relied on when assessing the value of the stimuli used.

The second experiment conducted by Pajor et al (2003) showed that cattle prefer tail twisting and the control over hitting, shouting or use of a cattle prod. Experiment three showed that cows find both pail and hand feeding desirable, while heifers find pail feeding desirable. Experiment four showed that cattle find shouting aversive, preferring gentle speaking. This research has the potential to improve animal welfare by encouraging modification of cow handling skills in the dairy. For example, when a human stimulus is required to move a cow, tail twisting should be chosen over other common methods to minimise stress.

A study conducted by Waiblinger et al (2004) examined the reaction to veterinary procedures of cows habituated to human contact over a five week period of gentle handling compared with cows that have not experienced additional handling. After five weeks of gentle handling for one of the two groups of cows used, a nine minute procedure (including four minutes of rectal palpation) was carried out on each cow. Several stress indicators were measured during the veterinary procedures, demonstrating that cows habituated to additional human handling had a lower heart rate ($P < 0.05$), kicked less ($P = 0.05$) and were less restless ($P = 0.015$, $P = 0.023$). This research has the potential to improve cow welfare by demonstrating to farmers that cattle exposed to positive human interactions show less signs of stress during routine husbandry procedures. This research could be improved by examining the response of cows broken-in as calves compared with a control group. This would help to determine whether the additional handling of calves is effective in reducing handling stress over the life of the cow.

A similar study conducted by Breuer et al (2003) examined the effects of positive and negative handling techniques on the behaviour and stress physiology of Holstein heifers. Forty-eight heifers were divided into eight groups. Over a five week period, four groups were handled positively and four groups were handled aversively. Positive handling involved moving the heifers slowly with pats, strokes and hands resting on the heifers, while negative handling involved slaps and hits with plastic pipe. After five weeks, the heifers were tested for their stress response by measuring blood cortisol concentration, flight distance and ease of movement in the presence of humans. It was found that heifers previously handled aversively had a greater concentration of cortisol ($P < 0.05$), a greater flight distance ($P < 0.001$) and moved away from humans towards a crush at greater speed ($P < 0.05$) and with greater

agitation ($P < 0.01$). This correlates with the results in Waiblinger et al (2004), showing that repeated exposure to human contact using positive handling techniques will minimise the signs of stress and fear observed in cattle during handling. This study could be further enhanced by retesting the same heifers in the future to find out whether a difference in handling technique will have a long term effect on physiological and behavioural responses to stressors.

All three studies examined have demonstrated that the signs of mental stress observed in dairy cattle can be minimised by the choice of handling technique and habituation to human contact. Thus, all three studies have the potential to improve animal welfare in the dairy industry by influencing a modification of handling practices. To successfully modify the handling of production animals, it is important to provide an incentive by demonstrating a link between animal welfare and production. Waiblinger et al (2004) suggest that a minimum stress approach to handling cows in the dairy could reduce the number of cows culled for reproductive reasons and reduce the calving interval by increasing the conception rate. This is supported by a study of sixty-six dairy farms in New Zealand (Hemsworth et al, 2000) which demonstrates that positive behaviour by stock handlers positively correlates with conception rate and that aversive behaviour negatively correlates with conception rate.

Seabrook (1984) also indicates that production in dairy cows is reduced by stress, attributing this to an increase in adrenalin release and a reduction in the amount of time that cows rest, resulting in an increase in energy wastage. Breuer et al (2000) has also related cow behaviour to production by showing that cows' ability to tolerate human presence positively correlates with milk yield ($P < 0.01$), milk fat ($P < 0.01$) and milk protein ($P < 0.05$), and negatively correlates with flinches, steps and kicks ($P < 0.05$). This shows that appropriate handling minimises cow stress and not only improves production, but also safety in the dairy.

Conclusion

Recent studies have demonstrated that cow stress can be minimised through the use of appropriate handling techniques and repeated exposure to humans using positive stimuli. Since cow stress has been correlated with reductions in productivity, these studies have the potential to improve cow welfare by modifying handling practices in the dairy.

References

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