

# Improving the welfare, ease of handling and productivity of calves through increased human contact and assessment of efficacy of current handling aids.

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## Introduction

In modern farm practice, much of the opportunity for frequent, benign contact between farm animals and humans has been greatly reduced. As farms get larger and there is a greater number of animals per stockperson, many opportunities for positive interactions with livestock, such as feeding time, have been replaced by mechanical techniques, while many of the aversive tasks associated with cattle handling, such as catching and restraint, still require human intervention. There is, therefore, an increased risk that animals' direct experiences with humans will be biased towards the negative, reinforcing their fear of humans and affecting their ease of handling, welfare, and productivity (reviewed in Rushen, Taylor and de Pasille, 1999). In recent research, the effects of additional human contact, traditional handling aids, and housing conditions on behaviour of cattle, ease of handling, welfare, productivity and quality of meat in veal calves has been investigated.

## Discussion

Lensink, Fernandez, Boivin, Pradel, Le Neindre and Veissier (2000a) studied the effects of providing additional contacts to veal calves on their welfare, responses to stress, health, productivity and quality of meat. Previously it had been established that providing calves with additional human contact is highly effective at reducing their fear of humans, leading to less avoidance and more unsolicited interaction with them, and consequently greater ease of handling (Lensink, Boivin, Pradel, Le Neindre and Veissier, 2000b). In veal calves the effects of increased human contact may be more salient than in other production systems because in many parts of the world, they are still reared in barren environments, housed in individual crates and physically and visually separated from conspecifics. Lensink et al (2000a) divided 22 male calves into two equal groups, one receiving minimal contact and the other receiving a total of 90 seconds additional handling (stroking of the neck and shoulders and sucking the handler's fingers) per day for the entire fattening period (21 days). Welfare was assessed by behavioural reactivity (reaction to handling, to surprise stimuli and to novelty), neuroendocrine responses to stress and general health (number of medical treatments and abomasal lesions). Neuroendocrine responses to stress were measured by assessing the sensitivity of the hypothalamo-hypophyseal-adrenocortical (HHA) axis to pharmacological blockade and stimulation. As this procedure required some aversive handling (eg. blood sampling), and could affect the behaviour of animals towards humans, it was performed at the end of the trial. At slaughter, plasma cortisol levels were measured and the right adrenal and thymus were weighed as indicators of chronic activation of the HHA axis. Further, the left adrenal was used to measure enzyme levels that would indicate a chronic activation of the HHA axis and sympathetic nervous system (SNS). Calf productivity was assessed through growth rates, and meat quality determined by measurement of the pH, colour and glycolytic potential (an estimator of muscle glycogen level prior to slaughter) of muscle at slaughter.

Lensink et al (2000a) revealed that gentling of calves decreased their reactions to handling, reduced the incidence of abomasal lesions and enhanced the glycolytic potential of muscles at slaughter. However, no effects were found on reaction of calves to novel or surprise stimuli, physiological indices of stress, or growth rates. Gently handled calves showed a reduced level of agitation and defaecation during the handling trial, suggesting that they were less disturbed by handling compared to control calves. This could partly explain the decreased glycolytic potential of control calves at slaughter. Since stimulation of the SNS results in muscle glycogen

breakdown, and is a sequel of fear and agitation, it is reasonable to assume that during transport of the control calves to slaughter their SNS was activated, muscle glycogen breakdown was initiated and thus glycogen potential was significantly reduced. The absence of an interaction between gentling and decreased chronic stress levels was attributed to the lack of stressful conditions for any of the animals (Lensink et al, 2000a).

Lensink, Roussi, Boivin, Pyykkonen and Veissier (2001) studied the effects of additional contact during rearing of calves, housed individually or in pairs, on their responses to humans and handling. Sixty four male calves were divided into two equal groups, half housed individually and half housed in pairs. In both housing groups, half the calves received minimal contact from stockpersons and the other half were stroked on the neck and shoulders for a total of 90seconds per day. The effects of housing and increased contact on reactions of calves to people entering or approaching the pen were investigated. Also, physiological (plasma cortisol levels and heart rate) and behavioural responses to loading onto a truck, transport and unloading were studied. Increased handling had a significant impact on reducing heart rate and improving ease of loading calves for transport. In contrast to the researchers' hypothesis it was found that regardless of the housing conditions, additional human contacts had the same effect: increased contact resulted in increased ease of handling and less adverse reactivity to humans. The small size of social group (only two calves) may explain this finding in part. However, it should also be noted that calves housed individually were only physically, not visually, separated from their conspecifics. Thus the conditions for individually housed animals may have been insufficiently different from those housed in pairs to produce a significant interaction between housing conditions and response to handling. If, indeed, such an interaction does exist, and group housed animals are less influenced by additional human contacts, it may be essential for these animals to receive greater amounts of positive contact during rearing to improve ease of handling.

Whilst it is extremely important to research methods of improving calf welfare and techniques to assist in ease of handling, it is also necessary to assess the efficacy and possible disadvantages associated with current handling techniques. To this end, Croney, Wilson, Curtis and Cash (2000) determined the behavioural responses of different types of calves to the application of one of three handling aids. Three groups of calves were used:

- 1) 15 intact Holstein males, intensively reared
- 2) 9 Angus and 6 Simmental intact heifers, extensively reared
- 3) 7 Angus, 3 Simmental and 5 Hereford castrated males, extensively reared.

Within each group, calves were assigned to 5 trios and each trio assigned a handling aid (electric prod, oar with rattles, or manual urging (a bare hand slap on the rump). Application of the aid to move calves through a chute was performed over a 7 day period. The calves' initial response to a stationary and then approaching handler were recorded and compared to results from the same test after application of the aid. To contrast efficacy of the aids, the number of applications and time required to move a calf through the chute were recorded. At the end of the trial, the handler buzzed the prod, or rattled the oar, of prod and oar calves to observe their responses to the sound.

Croney et al (2000) revealed that there was no significant difference for any group between the behaviours seen in the approach test before and after application of the handling aid, suggesting that a brief exposure to the handling aid is not sufficient to alter a calf's behavioural reactions. They also showed that the electric prod is the most effective handling aid in terms of time to move calves, and number of applications required. However, prodded calves also contacted the sides of the chute most often, increasing the risk of bruising and injury to the animal and possibly decreasing the quality and value of the meat. Additionally, prodded calves displayed the least amount of investigatory behaviour in the presence of a stationary human holding the aid, suggesting that they have an increased fear of humans and/or the aid.

Of particular interest in this study is the finding that both oar and prod calves visibly reacted to the sound of the aid they had experienced. Thus the calves had learnt and remembered the association between the sound of the aid and any unpleasant sensation accompanying the application of the aid. It could therefore be deduced that, once a calf has learned the sound that accompanies an application of an aversive sensation, that sound alone may be sufficient to encourage movement away from the handler.

The implications of these studies are enormous. Croney's study (Croney et al, 2000) implies reduced physical intervention followed by sound stimuli may prompt desired behaviour. This warrants and requires further investigation. Lensink et al (2000a, 2000b, and 2001) showed that increased positive human contact with calves greatly improves ease of handling. As a result, the frequency of frustration in stockpersons could be reduced resulting in less rough handling and enhanced animal welfare. Lensink et al (2000a) also note that, since gentling calves reduces animal reaction to handling, it also decreases energy expenditure during transport, minimising the risk of reduced meat quality. Topics worthy of further investigation include whether particular types of handling have greater effect than others; whether improved ease of handling is carried through to adult life; and whether there is a sensitive period during rearing when additional human contacts will have greater impact. Methods other than gentling to improve calf welfare, handling and productivity will also need to be researched. Although many studies have been performed assessing methods of improving calf welfare and ease of handling there is much room for further investigation.

## Conclusions

It is evident from these studies that the welfare and productivity of calves may be improved through increased handling of animals, and correct and appropriate use of handling aids. Additionally, by extra contact with cattle we can reduce the difficulty in handling animals for routine management practices, thus reducing stress for both the animal and the stockperson, and productivity and quality of meat may be likewise improved. Therefore, it is of great concern that in "efficient", cost-effective modern farming there is a tendency towards a decreased amount of human-animal contact and increased automation of practices.

## References

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Note: The fact that three of the research papers cited in this essay are written by the same main author should be noted. Although other researchers are investigating similar areas, this author

was unable to find any relevant papers from these researchers within the last 12months. This may mean that there may be some bias in the results presented here.