Human-Animal Relationships and Productivity on the Farm

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Introduction

The link between behaviour of a stockperson towards animals and the animals' behavioural response to humans is an important indicator of animal welfare. However, the economical importance of the human-animal relationship has only recently been acknowledged. The potential to improve animal productivity by improving these human-animal interactions is a positive step towards improving the welfare of production animals on a broad scale. The impact of the stockperson's behaviour on animal behaviour and productivity has been studied in both dairy cows and veal calves with significant results.

Aim of the studies

Breuer, Hemsworth, Barnett, Matthews, and Coleman (2000) examined the relationships between the attitude and behaviour of the stockperson towards cows and the behavioural response to humans and milk production of these cows at 31 commercial dairy farms over one lactation. The study aimed at identifying a fear-productivity relationship in commercial dairy cows to allow farmers to reduce fear to increase productivity through improvements in their behaviour towards their cows. Similarly, Lensink, B.J., Fernandez, X., Boivin, X., Pradel, P., Le Neindre, P. and Veissier, I. (2000) investigated whether gentle (positive) contacts affects the welfare and productivity of calves and the quality of veal meat. Since it has been previously established that providing additional gentle contacts by the stockperson to veal calves leads to an improvement of the human-animal relationship (Lensink, B.J., Boivin, X., Pradel, P., Le Neindre, P., Veissier, I., 2000), the study was directed at identifying a link between the human-animal relationship and productivity.

Both studies imply a need to reassess stockperson behaviour and animal handling techniques. Pajor, E.A., Rushen, J. and de Pasille, A.M.B. (2000) have used aversion learning techniques to establish which handling procedures cattle find most aversive. This is based on the principle that animals learn to avoid treatments they find aversive. So with the identification of particularly aversive handling procedures and the realisation of the link between the human-animal relationship and productivity, the welfare of dairy cattle and veal calves should begin to improve.

The experiments

Lensink et al (2000) housed 22 veal calves in individual crates from 2 weeks of age. Half received minimal contact with the stockperson (controls) while the other half received additional "gentle contacts" (stroking, talking to and allowing finger sucking after milk feeding) every day of the 21 week study. In week 15 calves were loaded into a cart on wheels and transported to a test arena by the stockperson and one other. The time taken to load each calf, occurrence of defaecations and calf behaviour in the cart was used to assess the calves' behavioural reactions to handling. Control and gentled calves did not differ in time taken to load into the cart, however, control calves were more agitated and defaecated more in the cart than gentled calves. The calves' reactions to unusual events not involving humans was assessed through an umbrella opening suddenly and having water thrown on their backs. There was no difference in reactions between both groups of calves. Calf productivity was evaluated by health, growth and meat characteristics. Control calves showed a higher incidence of abomasal lesions than gentled calves, while daily weight gain and cold carcass weight did not differ between the two. Glycolytic potential of the semimembranosus muscle at 45 minutes post mortem was significantly higher for gentled calves than controls. Lastly, chronic stress of calves was estimated sensitivity of the hypothalamo-pituitary-adrenocortical axis to pharmacological blockade and stimulation, thymus and adrenal gland weights and tyrosine hydroxylase (TH) and phenyl N-methanolamine transferase (PNMT) activities. Interestingly, no differences were found between calves in any of these measurements.

Breuer et al (2000) assessed human and cow behaviour and cow productivity attempting to find relationships between them. A cow's fear of humans was estimated by her approach to a stationery person in a test arena. In addition, cow agitation was measured during milking, attaching and removing the cups and when forcing cows into position by the number of flinch and step and flinch, step and kick responses. Human behaviour when moving cows, forcing cows into position for milking and attaching and removing cups was recorded as either positive (pats or strokes) or negative (slaps, pushes, hits or tail-twists). In addition, the number of arm waves and vocalisations, either soft or harsh, were recorded. The stockperson's attitude to dairy cows was estimated by a questionnaire. Finally, productivity was based on records of total milk yield, protein and fat. Overall, some of the cow behaviour variables were moderately to highly correlated with productivity, eg. the average time the cow spent within 3 metres of the person in the approach test was positively correlated with milk yield, fat and protein and cow agitation was negatively correlated with milk yield and protein. Negative handling by the stockperson negatively correlated with milk yield, protein and fat. Lastly, the number of vocalisations and negative behaviour significantly correlated with cow agitation.

Pajor et al (2000) repeatedly walked dairy cows down an aversion race and applied treatments at the end to interpret behavioural responses to particular handling methods. Initially, treatments of food, brushing, or hitting/shouting were compared. Cows on hit/shout treatment took longer to walk down the race than the other treatments while cows given food took less time to walk through the race than control cows. Interestingly, brushed cows took longer to walk down the race than control and fed cows in the early trials. Methods of moving cows were then compared, including; tail twist, hit, electric prod, shout and control. Cows on electric prod and shout treatments took longer to walk down the race than other treatments. However there was no difference between the control, hit and tail twist cows in time taken to move down the race. Lastly, an attempt was made to differentiate between treatments thought to be rewarding, rather than aversive. These included hand feeding and gentling (patting and speaking to) and control. Interestingly there was no difference between the groups in time taken to move down the race.

Discussion and implications

Significant findings regarding human-animal interactions and animal productivity have been exposed by these studies, however more research is necessary to qualify these findings. Lensink et al (2000) have shown that gentling calves reduces their reactivity to handling by humans, reduces the incidence of abomasal lesions and enhances the glycolytic potential of muscles at slaughter. The authors argued that the welfare of gentled calves was improved due to the decrease in abomasal lesions. However, the lack of difference in weight gain and chronic stress levels between the groups contradicts this. The authors have proposed that the lack of difference in growth rates may be explained by the absence of negative handling in this study. Hemsworth, P.H. and Barnett, J.L. (1991) have shown that high fear levels, through a chronic stress response, may depress growth and reproductive performance in pigs. Similarly, Breuer et al (2000) has shown that negative handling affects the productivity of dairy cows. Although control calves were more afraid of humans than gentled calves, this was probably not sufficient to alter growth rate. The lack of difference in chronic stress between the groups indicates a need for further investigations into causes of chronic stress in calves eg. housing, lack of external stimuli or social contact.

Breuer et al (2000) have likewise shown that fear of humans may have practical implications for the productivity of commercial dairy cows. The approach behaviour of cows to a human, used to assess fear, was significantly correlated with farm productivity. Actually 19% of the variation in milk yield was accounted for by approach behaviour of cows. There was only a moderatecorrelation between stockperson behaviour and cow approach behaviour. However, the response to an unfamiliar person may not reflect the response to the familiar stockperson. Experiments by de Passille et al (1996) found that dairy calves exhibited clear avoidance of a handler that had previously handled them in a negative manner, in contrast to handlers unfamiliar to the calves, or that had previously handled them in a positive manner. In addition, the authors found that when cow restlessness was high, productivity was low. Therefore while

associations between stockperson behaviour and cow fear were only moderate in this study, the associations between cow fear and productivity and stockperson behaviour and productivity implies that human-animal interactions may be involved in fear-productivity relationships. Subsequently, there is a need for further research into the stockperson behaviours that may regulate the commercial cow's fear of humans.

Pajor et al (2000) have begun to identify some of these behaviours through identifying which handling practices cattle find most aversive. The results illustrate the effectiveness and the limitations of the aversion race to evaluate handling practices for dairy cows. Hit/shout and electric prod treatment were clearly defined as aversive, while food treatments were obviously positive. However, the inability to discriminate between tail twists, hits and control illustrates the limits on sensitivity of the test. Likewise, the inability to distinguish between positive treatments, food, brushing and control further indicates the limits of the test. An interesting factor was the response to gentle contacts (brushing). In this experiment, gentling was less effective than food in the development of human-animal interactions. However, the differences between brushing and food treatments decreased with time, suggesting that cows may habituate to the brushing.

Conclusions

The significance of the human-animal relationship's effect on animal productivity has important implications for veal calves and dairy cattle in the future. Improved veal quality and high milk yield, protein and fat are extremely desirable commercially so the opportunity exists to manipulate human behaviour regulating fear responses in order to improve productivity. Identifying human behaviours that are either aversive or rewarding towards animals is the first step in modifying stockperson behaviour to reduce an animal's fear, simultaneously improving their welfare.

References

Breuer, K., Hemsworth, P.H., Barnett, L.R., Matthews, L.R. and Coleman, G.J., 2000. Behavioural response to humans and the productivity of commercial dairy cows. Appl. Anim. Behav. Sci. 66:4, pp 273-288.

de Passille, A.M., Rushen, J., Ladewig, J. and Petherick, C., 1996. Dairy calves' discrimination of people based on previous handling. J. Anim. Sci. 74, pp 969-974.

Hemsworth, P.H. and Barnett, J.L., 1991. The effects of aversively handling pigs either individually or in groups on their behaviour, growth and corticosteroids. Appl. Anim. Behav. Sci. 30, pp 61-72.

Lensink, B.J., Boivin, X., Pradel, P., Le Neindre, P. and Veissier, I., 2000. Reducing veal claves' reactivity to people by providing additional human contact. J. Anim. Sci. 78, pp 1213-1218.

Lensink, B.J, Fernandez, X., Boivin, X., Pradel, P., Le Neindre, P. and Veissier, I., 2000. The impact of gentle contacts on ease of handling, welfare, and growth of calves and on quality of veal meat. J. Anim. Sci. 78, pp1219-1226.

Pajor, E.A., Rushen, J. and de Passille, A.M., 2000. Aversion learning techniques to evaluate dairy cattle handling practices. Appl. Anim. Behav. Sci. 69:2, pp 89-102.