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## Improving productivity with better stock handling

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### ABSTRACT

Human factors are generally recognized as influential factors affecting the welfare and productivity of farm animals, and we have proposed that in intensive animal production systems there are some important sequential relationships between the attitude and behaviour of the stockperson towards farm animals and the behaviour, performance and welfare of farm animals. Basically we have suggested that because a stockperson's behaviour towards farm animals is largely under volitional control, this behaviour is strongly influenced by the attitudes and beliefs that the stockperson holds about the animals. Furthermore, the stockperson's behaviour towards animals affects the animals' fear of humans which, in turn, may affect the animals' productivity and welfare. It is the occurrence of a stress response in animals which are highly fearful of humans which places their productivity and welfare at risk. We have published data which strongly support these interrelationships between human attitude and behaviour and animal behaviour, productivity and welfare. The results of recent research in the intensive animal industries indicate the excellent opportunity which exists to improve animal productivity and welfare by training and selecting stockpersons to have desirable attitudinal and behavioural profiles towards farm animals.

**Keywords:** Human attitude, human behaviour, handling, fear, stress, welfare, productivity.

### INTRODUCTION

With the exception of the immediate family, many humans interact more with domesticated animals than they do with other humans. These interactions are often frequent and intense and consequently complex and strong social relationships can be formed between humans and domesticated animals. Results of recent research on the interactions between humans and farm animals show some surprising and substantial consequences for the animals.

Over the last 13 years we have been studying the influence of two apparently important human factors, the attitude and behaviour of stockpersons towards farm animals. As a consequence of this research, we have proposed that in intensive animal production systems there are some important sequential relationships between the attitude and behaviour of the stockperson towards farm animals and the behaviour, performance and welfare of farm animals. Basically we have suggested that in situations where farm animals are fearful of humans and receive frequent human contact, the productivity and welfare of these animals may be at risk due to either a series of acute stress responses or a chronic stress response. Secondly, we have suggested that the level of fear of humans by farm animals is predominantly regulated by the behaviour of the stockperson towards these animals. Finally, we have suggested that because a stockperson's behaviour towards animals is largely under volitional control, this behaviour is strongly influenced by the attitudes and beliefs that the stockperson holds about the animals. We have published data which strongly support these interrelationships between hu-

man attitude and behaviour and animal behaviour, productivity and welfare. The aims of this paper are to briefly review this research and to consider the opportunities to improve the productivity and welfare of farm animals by improving the attitudinal and behavioural profiles of stockpersons in the animal industries.

### REVIEW OF THE RESEARCH ON HUMAN-ANIMAL INTERACTIONS

The most comprehensive research on human-animal interactions in agriculture has been conducted in the pig industry and this research has indicated that human-animal interactions may have serious consequences for the productivity and perhaps welfare of the animal. Commercial pigs may be highly fearful of humans (Hemsworth and Barnett, 1987) and research on both experimental and commercial pigs has shown that high levels of fear of humans by pigs may markedly reduce the growth and reproductive performance of pigs (Gonyou *et al.*, 1986; Hemsworth *et al.*, 1981a, b, 1986, 1987, 1989; Hemsworth and Barnett, 1991). The mechanism involved appears to be a chronic stress response, because in a number of experiments, pigs which were highly fearful of humans had a sustained elevation of free corticosteroid concentrations with consequent adverse effects on nitrogen balance and reproduction (Barnett *et al.*, 1983; Hemsworth *et al.*, 1981a, 1986, 1987). Furthermore, the results of studies on commercial pigs (Hemsworth *et al.*, 1981b, 1989) indicate that high levels of fear of humans may be a major limiting factor to the reproductive performance of commercial pigs.

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For example, in one of the studies, fear of humans accounted for 20% of the variation between farms in reproductive performance (Hemsworth *et al.*, 1989). Fear of humans may also have important implications for the welfare of commercial pigs if, as seen in experimental pigs, commercial pigs that are highly fearful of humans experience a chronic stress response.

Therefore, we have suggested that in situations in which the farm animal is regularly or frequently handled and this animal is fearful of humans, there is the opportunity for the animal to experience an acute or a chronic stress response. It is the occurrence of a stress response, particularly a chronic stress response, that places both the animal's productivity and welfare at risk. The results of our research on both experimental and commercial animals strongly support this proposition and demonstrate that the productivity and probably welfare of a substantial proportion of farm animals may be at risk due to high levels of fear of humans. The results of studies on dairy cattle, goats and poultry and the results of a study from another laboratory on pigs also support this proposition (Arave *et al.*, 1985; Barnett *et al.*, 1992; Bredbacka, 1988; Collins and Siegel, 1987; Gross and Siegel, 1979, 1980, 1982; Hemsworth and Barnett, 1989; Jones and Hughes, 1981; Lyons, 1989; Seabrook, 1972a, 1972b; Seabrook and Bartle, 1992; Thompson, 1976; Warwick *et al.*, 1977).

#### HUMAN FACTORS REGULATING FEAR OF HUMANS BY FARM ANIMALS

Our research in the pig industry has shown strong correlations between the attitude of the stockperson, the behaviour of the stockperson and the level of fear of humans by commercial pigs (Hemsworth *et al.*, 1989). The aversive properties of humans, which will increase the animal's fear of humans, include hits, slaps and kicks by the stockperson, while the rewarding properties, which will decrease the animal's fear of humans, include pats, strokes and the hand of the stockperson resting on the back of the animal. The proportion of these aversive interactions to the total physical interactions will determine the commercial pig's fear of humans (Hemsworth *et al.*, 1989).

Therefore we suggest that because a stockperson's behaviour towards animals is largely under volitional control, this behaviour is strongly influenced by the attitudes and beliefs that the stockperson holds about the animals. Furthermore, it is the stockperson's behaviour which is an important determinant of the animal's fear of humans.

#### POTENTIAL OUTCOMES ARISING FROM THIS RESEARCH

The overall proposal we have been developing is that in intensive animal production there are some important sequential relationships between stockperson attitude and behaviour and animal behaviour, performance and welfare. The evidence for this is firstly from experimental studies, particularly on pigs, in which fear of humans has been manipulated and the consequences for the animal examined. Secondly, the correlated relationships between human and animal variables

have been examined in the industry, particularly the pig industry.

To examine whether there are cause and effect relationships existing between these human and animal factors in the pig industry, we have been studying the effects of improving the behavioural profiles of stockpersons towards pigs on the level of fear and productivity of pigs. Recently collected data from a 4-year study at 25 commercial farms, indicate that a cognitive-behavioural intervention treatment, designed to improve the behaviour of stockpersons towards breeding pigs, resulted in a substantial improvement in the behaviour of stockpersons and a marked reduction in the level of fear of humans by pigs (Hemsworth *et al.*, unpublished data). Furthermore, at the modification farms there was a strong tendency (which approach statistical significance at the 5% probability level) for an improvement in the reproductive performance of these pigs (6% improvement versus 3% reduction in number of piglets born per sow per year at the control farms). Therefore, there is evidence that human factors, by affecting fear of humans by pigs, may be important factors affecting the productivity and welfare of commercial pigs. It should be recognized that it is also possible that the stockperson's attitude towards pigs, by affecting other important human factors which may influence the work performance of the stockperson such as work ethic and job satisfaction, may influence the productivity and welfare of commercial pigs. Therefore, it appears that the attitude and behaviour of stockpersons towards farm animals may be integral components in the pathway(s) which affect animal productivity and welfare. These results also indicate that there may be considerable opportunity for the pig industry to improve the performance and welfare of pigs by training and selecting stockpersons in terms of their attitude and behaviour towards pigs. Similar research is required in other animal industries. One likely outcome of future research is the development of training and selection procedures which improve the productivity and welfare of farm animals by improving the attitudinal and behavioural profiles of stockpersons towards farm animals.

#### ANIMAL WELFARE IMPLICATIONS

In addition to productivity risks, we have also proposed that the welfare of intensively handled farm animals is at risk in situations in which these animals are highly fearful of humans. This concern for welfare is based firstly on the finding that highly fearful animals may experience a chronic stress response and secondly on the reasonable belief that as stress increases, the risks to welfare increase (Barnett and Hutson, 1987; Barnett and Hemsworth, 1990). Furthermore, in situations in which animals are fearful of humans and thus the attitude and behaviour of the stockperson towards the animals may be negative, the stockperson's commitment to the surveillance of and the attendance to welfare issues can be questioned.

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