

**Brief Communication**

**INFLUENCE OF AMPEROZIDE ON DISEASE OCCURRENCE  
IN A PIG FATTENING UNIT**

The social and physical environments of animals and man have long been implicated in the etiology of infectious diseases. However, controlled experiments on adverse social and environmental stimuli and animal health are meagre (*Kelley 1980*). Recently the term psychoimmunology was coined to reflect the growing interest in the relationship between stress, reduced immune function and illness. For more than a decade it has been known that prolonged secretion of stress hormones, particularly corticosteroids, contributes to regression of the lymphoid tissues (*Selye 1974, Freeman 1975*). Now it has been shown more specifically, that the level of secretory immunoglobulin A is reduced in periods of high stress and that the activity of lymphocytes and natural killer cells are significantly reduced after intense stress periods (*Wood 1985*). Although the relationship between stress and immunity thus seems to be clear, studies linking those to disease are still a rarity.

The subclinical disease incidence in intensive pig production is generally considered as being high. In Fig. 1 the average dis-

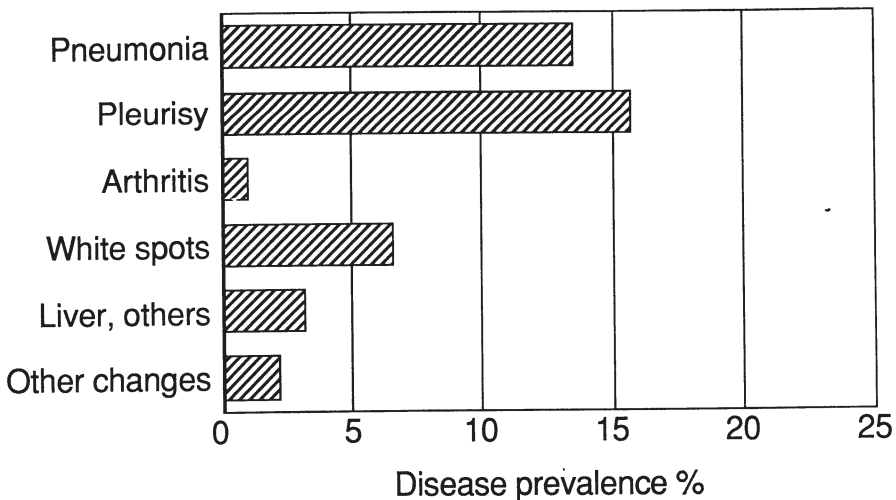


Figure 1. Disease prevalence as recorded at slaughter at 4 abattoirs in southern Sweden in 1984. A total of about 1 million pigs are included.

ease prevalence in about 1 million slaughtered pigs, as recorded at slaughter in the southern part of Sweden, is illustrated. In particular lung and liver affections are shown.

A common practice in modern pig production is the occurrence of specialized fattening units. When unfamiliar pigs from different litters are mixed in conjunction with weaning and introduction into fattening units, they fight to establish a social dominance pattern (*Graves et al.* 1978, *McBride et al.* 1964, *Meese & Ewbank* 1973). Fighting is known to be a potent activator of the pituitary-adrenal axis (*Barnett* 1958, *Bronson & Eleftheriou* 1965, *Brain & Nowell* 1971). Both the introduction to a new environment and to new pen-mates on entering the fattening unit constitute intense psychological stressors, leading to elevated levels of circulating corticosteroids in the pig (*Dantzer & Mormede* 1983). We wanted to test the hypothesis that stress in conjunction with the introduction of pigs into fattening units was responsible in part for the high disease occurrence observed.

Amperozide is a new psychotropic compound with very potent effects on limbic brain areas in animals (*Christensson* 1985). In several animal models it has been shown as being a potent and nonsedative inhibitor of aggressive behaviour. Amperozide has also been shown to inhibit excessive activity in the pituitary-adrenal axis in chronically stressed pigs exhibiting the wasting pig syndrome (*Olsson et al.* 1984). On account of its antiaggressive and antistress properties amperozide seemed to be an interesting compound providing the means for testing the relationship between stress, immune function and illness following or during penning.

In a farm with two identical fattening units, pigs were allotted either to a nontreated control group in one of the fattening units or to an amperozide treated group in the other fattening unit. The 262 nontreated animals were offered 200 g each of non-medicated feed upon penning, while the 261 animals to be treated were each offered 200 g of feed containing 0.5 mg of amperozide hydrochloride per g, corresponding to a dose of 4 mg of amperozide per kg of body weight. Amperozide was given only once at penning. Apart from the amperozide treatment, pigs in the two fattening units were treated exactly the same until slaughtered. Occasional deaths were recorded during the fattening period. At slaughter, disease prevalence was recorded according to normal practice at the abattoir.

Amperozide was effective in reducing aggressive behaviour at penning and the dominance order was formed without heavy fightings. Thus social pressures at penning were minimized in the amperozide treated group. In the control group heavy fighting occurred at penning and fights were common throughout the first two days. An apparent difference in the level of stress at penning was thus present in the two groups. The number of animals with one or more diseases recorded at slaughter was significantly reduced ( $P < 0.01$ ) in the amperozide treated group, 25.7 %, in comparison with the nontreated group, 38.1 %. The total disease prevalence was reduced by 36 % or from 47 % in the nontreated group down to 30 % in the amperozide treated group (some animals had more than one disease recorded). In Fig. 2 the disease prevalence recorded are shown for the non-

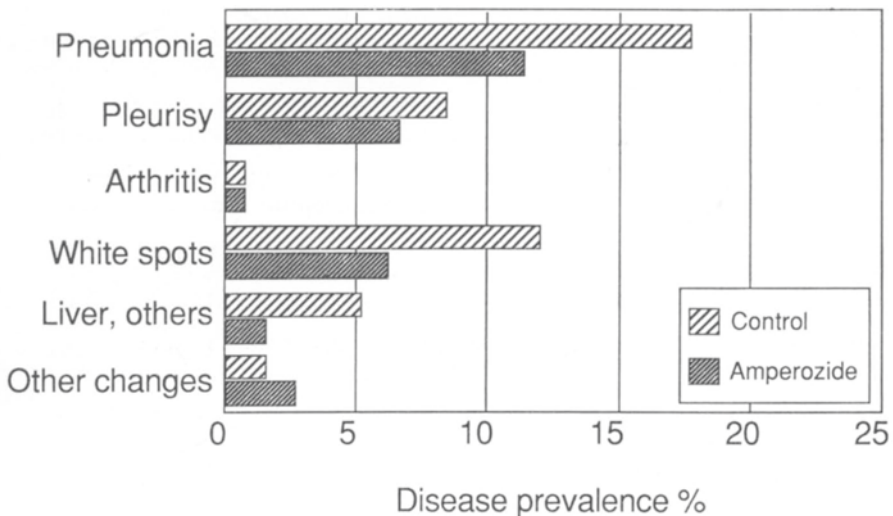


Figure 2. Disease prevalence as recorded at slaughter in non-treated and amperozide treated pigs.

treated and amperozide treated groups as indicated. The number of lung and liver affections were significantly lower ( $P < 0.05$  and  $P < 0.001$ , respectively) in the amperozide treated group compared to the control group. A nonsignificant reduction in mortality rate from 5.3 % down to 3.8 % using amperozide was observed.

In conclusion, the disease prevalence in a group of fatteners was significantly reduced by one treatment with an antistress

agent at penning. It thus seems most likely that the stress response released in conjunction with normal handling practice at the introduction of the pigs into the fattening unit is partly responsible for the high disease prevalence recorded at slaughter showing a link between stress, immune function and disease prevalence in pig production. Amperozide treatment at penning is one possible way of reducing the negative influence of social pressures when mixing unfamiliar pigs.

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#### REFERENCES

- Barnett, S. A.*: Physiological effects of "social stress" in wild rats - 1 The adrenal cortex. *J. Psychosom. Res.* 1958, 3, 1—11.
- Brain, P. F. & N. W. Nowell*: Isolation versus grouping effects on adrenal and gonadal function in albino mice. 1 The male. *Gen. Comp. Endocrinol.* 1971, 16, 149—154.
- Bronson, F. H. & B. E. Eleftheriou*: Adrenal response to fighting in mice: Separation of physical and psychological causes. *Science* 1965, 147, 627—628.
- Christensson, E.*: Selective presynaptic and limbic effects on DA neurotransmission with a new psychotropic drug, amperozide. Manuscript in preparation.
- Dantzer, R. & P. Mormede*: Stress in farm animals: A need for re-evaluation. *J. Anim. Sci.* 1983, 57, 6—18.
- Freeman, B. M.*: Physiological basis of stress. *Proc. Roy. Soc. Med.* 1975, 68, 427—437.
- Graves, H. B., K. L. Graves & G. W. Sheritt*: Social behaviour and growth of pigs following mixing during the growing-finishing period. *Appl. Anim. Ethol.* 1978, 4, 169—180.
- Kelley, K. W.*: Stress and immune function: A bibliographic review. *Ann. Rech. Vét.* 1980, 11, 445—478.
- McBride, G., J. W. James & N. Hodgins*: Social behaviour of domestic animals. *Anim. Prod.* 1964, 6, 129—139.
- Meese, G. B. & R. Ewbank*: The establishment and nature of the dominance hierarchy in the domesticated pig. *Anim. Behav.* 1973, 21, 326—334.
- Olsson, N.-G., G. Andersson, A. Björk, E. Christensson, K. Martinsson & J. Rabe*: Medicinsk behandling av "pellesyndromet" hos gris (Medical treatment of wasting pigs). *Svensk vet. tidn.* 1984, 36, 601—605.
- Selye, H.*: Stress without Distress. Edited by Hodder & Stoughton, London 1974.
- Wood, C.*: How stress may predispose to disease. *New Scientist* 1985, 106, (1463), 31.

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