THE HUMAN-ANIMAL RELATIONSHIP IN ANIMAL PRODUCTION

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1 Introduction

Ever since domestication of our farm animals began, the relationship between the stockman and the animals has always been close. For centuries, the relationship between the stockman and the animal has always been a symbiotic one, with for example cattle being dependent on man for the provision of shelter, nutrition and general care while man in turn benefited from milk, dung for fuel or fertiliser, and heat production (English et al., 1992). Farms were most of the time very small, and complete families lived from and with a couple of animals, the family and their cattle sharing often adjacent parts of the same accommodation. Consequently, the contact between the stockperson or the family and the animals has always been very close. Nowadays, especially since World War II, farm practice has changed, the main aim being for most of the countries being self-sufficient in agricultural production. This has led to an increase in the size of the farms, which in the case of animal production, reducing the opportunity for contact between the stockpersons and their animals. Furthermore, labour-saving technology has been introduced (e.g. electronic feeders, milking robots) with a substantial reduction in (positive) contact time between the stockpersons and their animals. On the other hand, the aversive tasks associated with farm animal management have remained, such as transport, medication, vaccination. As a consequence, the contacts that remain might lead to only negative experiences for the animals, leading to fear reactions towards humans, with possible consequences on the animal’s welfare and production.

In this paper, we will briefly describe the type of interactions that can exist between the stockperson and his animals, indicate its possible consequences on the welfare of the animal and the production of the farm, and describe the origin of human behaviour towards animals. We will conclude with a note on the human-animal relationship in organic animal production.

2 The contact between the stockperson and the animals and the consequences on the animal’s behaviour

On a farm, the stockperson can have different physical and non-physical interactions with the animals. The physical (inter)actions are often made with the hands and the arms, like touching, stroking, slapping, hitting, or can include the hands, for example holding a stick to hit an animal. The non-physical (inter)action can be of different kinds, like voice (intensity, intonation), movements with the body, smell, noise (a man approaching) (Seabrook et Bartle, 1992). Often a mix of these actions is found when the stockperson is working with the animals during feeding, milking, surveillance, medical treatments, moving from one place to another etc. Lensink et al. (2000a), in their study on commercial veal farms with calves housed in individual crates, described 15 different physical and non-physical contacts from...
the stockperson towards the calves during milk feeding. The frequency of the stockperson’s contacts with the calves was 30 interactions per 100 calves, with a range of 0 to 75 per 100 calves. It is the nature and the frequency of these contacts that determine greatly the animal’s reaction towards the stockperson and to man general.

Several research projects, mostly conducted on animals kept under intensive conditions (pigs, poultry, veal), have demonstrated the physical contacts qualified as “negative” (hits, slaps) by the observer, induce a withdrawal behaviour of the animals towards the stockperson, often interpreted as “fear”. For example, pigs receiving a shock from an electric prodder or being hit each time they approach a man, approach less often and more slowly than man that pigs not receiving this treatment. (Gonyou et al., 1986; Hemsworth et al., 1986; Paterson et Pearce, 1989). Similar results have been found in veal calves (de Passillé et al., 1996; Lensink et al., 2000b). Physical contacts qualified as “positive” (touching carefully, stroking) reduce the animals tendency to avoid man and increases its tendency to interact with him (pigs: Gonyou et al., 1986; Tanida et al., 1995; veal calves: Lensink et al., 2000b, c).

Non-physical interactions are also important for the animals’ reactions towards man. The fact that the animals see the stockperson during feeding (something rewarding for the animals) potentially reduces their avoidance of the stockperson and can increase their tendency to interact with him. Some of the effects of “positive” contacts with animals on their behaviour could be explained by the fact that they are often associated with feeding. Jago et al. (1999) demonstrated that calves having received milk from a non-interacting human approached more easily an unknown person than calves that received milk without human intervention. This treatment seemed even more efficient than giving “positive” contacts (stroking, letting suck the fingers) outside feeding time. Furthermore, in poultry, regular visual presence of a stockperson reduced the avoidance responses of the animals towards man (Jones, 1993; Barnett et al., 1994).

### 3 The consequences of the contact between the stockperson and the animals on the animals’ stress responses

Fear responses following "negative" contacts with man can not only induce avoidance behaviour of the animals but also physiological stress responses. Pigs having received “negative” contacts (electric shock when approaching man) show a higher increase in blood cortisol levels when a man enters their home pen compared to pigs having received "positive" contacts (gentle stroking) (Hemsworth et al., 1986). In a similar way, Boissy et Bouissou (1988) have demonstrated that heifers used to regular non-aversive contacts with humans (leading by a rope, stroking) showed a lower increase in blood cortisol levels and heart rate following some common management practices (capture, moving from one place to another) than heifers not having received these non-aversive contacts. Dairy cows badly treated by a person (electric shocks, hits) also demonstrate a higher heart rate during milking when this person is present compared to other, non-treated, cows (Rushen et al., 1999). These results demonstrate that a stockperson (or man in general) can be at the origin of acute stress responses. Regular, long-term contacts with a stockperson can also have consequences on chronic stress responses. Hemsworth et al. (1996b) found elevated adrenal weights of pigs having received "negative" contacts, considered as a sign of a chronic stress state for the animal.

### 4 The consequences of the contact between the stockperson and the animals on animal production

The interactions between the stockperson and the animals can also have consequences on the productivity of the animals. Generally, “negative” contacts (hits, slaps, shocks) reduce live weight gain of pigs (Gonyou et al., 1986; Hemsworth et Barnett, 1991; Hemsworth et al., 1996a) and poultry (Gross et Siegel, 1980; Jones et Hughes, 1981). They also induce a decrease in milk production in dairy cows (Rushen et al., 1999) and reduce the fertility in sows (Hemsworth et al., 1986). However, although they find a clear relationship between the contacts the animals received and their behaviour towards humans,
certain researchers did not find any effect of "negative" or "positive" contacts on the productivity of the animal (pigs: Paterson et Pearce, 1989, 1992; Pearce et al., 1989; veal calves: Lensink et al., 2000c, 2001b).

The contact between the stockperson and the animal can also have an effect on the meat quality. In their study on commercial veal farms, Lensink et al. (2001a) found that calves originating from stockpersons behaving "positively" with them had lower pH levels of the meat and showed more often "light" meat (appreciated by the consumers) than calves originating from stockpersons behaving more "negatively" (Table 1). The origin lies probably in the effects of human contact on the animal's behaviour. Calves originating from "positive" stockpersons were easier to load and unload for transport and showed lower heart rates during handling compared to calves originating from "negative" stockpersons (Table 1). This indicates lower energy expenditure during handling and transport before slaughter, increasing therefore the glycolytic potential of the muscles important for the maturation of the meat.

Table 1 — The influence of stockperson's behaviour on calves' reactions to transport and quality of veal meat (adapted from Lensink et al., 2001).

<table>
<thead>
<tr>
<th>Stockperson behaviour</th>
<th>Positive</th>
<th>Negative</th>
<th>SEM</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effort to load calf(^a)</td>
<td>0.45</td>
<td>0.59</td>
<td>0.01</td>
<td>0.02</td>
</tr>
<tr>
<td>Heart rate during loading (beats/min)</td>
<td>199.9</td>
<td>206.0</td>
<td>18.4</td>
<td>0.03</td>
</tr>
<tr>
<td>Heart rate during unloading (beats/min)</td>
<td>185.6</td>
<td>193.0</td>
<td>22.7</td>
<td>0.03</td>
</tr>
<tr>
<td>Carcass weight (kg)</td>
<td>114.2</td>
<td>114.8</td>
<td>4.9</td>
<td>0.85</td>
</tr>
<tr>
<td>Carcass colour (^b)</td>
<td>14.5</td>
<td>23</td>
<td>-</td>
<td>0.02</td>
</tr>
<tr>
<td>pH at 24 h of SM muscle (^c)</td>
<td>5.42</td>
<td>5.45</td>
<td>0.001</td>
<td>0.07</td>
</tr>
</tbody>
</table>

\(^a\) Effort to load = (frequency of pushes, slaps or shouts by the truck driver) / distance from crate to truck.

\(^b\) Percentage of carcasses classified as pink or dark pink (not desired) following a 4-point scale: 1 = white; 2 = pale pink; 3 = pink; 4 = dark pink.

\(^c\) SM muscle = Semimembranosus muscle.

Through his behaviour towards the animals, the stockperson plays an important role in the welfare and the productivity of the animals. In order to improve the welfare of the animals and potentially improve also the productivity, we have to understand better the origin of the human behaviour towards the animals. We have to look mainly on the psychological side, attitudes and personality traits of the stockperson being important components of the human behaviour towards animals or any general subject.

5 Attitudes or personality traits of the stockperson and his behaviour towards animals

Research in pig industry, trying to identify factors determining stockpersons' behaviour towards animals, revealed that stockpersons’ behaviour is most closely related with the attitude they hold towards animals (Coleman et al., 1998; Hemsworth et al., 1989). Attitude is hereby defined as a 'psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour' (Eagly and Chaiken, 1993). In these studies, stockpersons with a positive attitude towards positive behaviour towards pigs were found to show a lower percentage of negative contacts when working with them (Hemsworth et al., 1989). This body of research has been primarily based on Azjen and Fishbein's "theory of reasoned action" (Fishbein, 1980). According to this theory, a person's intention to perform a behaviour results from his/her attitude towards that behaviour, combined with subjective norms. In turn, attitudes are linked with beliefs that the behaviour leads to a certain outcome and by the evaluation of
these outcomes. The model furthermore proposes that other factors like personality and demographic variables (e.g., age, gender, education) modify indirectly someone's behaviour through their effect on attitudes. However, external factors could also affect someone's behaviour directly. A stockperson might intend to interact individually with all the animals, but work pressure, due to a high number of animals to take care of, might prevent him/her from interacting with them.

The extensive and important work of Hemsworth and colleagues on the human-animal relationship in especially the pig production (for review see Hemsworth and Coleman, 1998), have led these researchers to develop a model which aims to explain the relationship between farmers’ attitudes, their behaviour towards animals, the welfare of the animals and the productivity of the animals. According to their model (Figure 1), the stockperson’s attitudes influence his/her behaviour towards his/her animals. Negative attitudes will lead to high frequency of negative interactions with animals (hits, slaps, shouting). These negative interactions will lead to fear reactions of the animals, fear reactions shown in a wide range of situations in which humans can be present. A state of "chronic stress" can be induced in these animals following a repetition of negative acts by the stockperson. This state of fear, which decreases the growth and reproduction performances of the animals, is therefore at the origin of the decrease of production results found on certain farms. In counterpart, the animals’ fear reactions and the stockperson’s behaviour can reinforce the (negative) attitudes that are at the origin of these fear reactions and behaviour.

![Figure 1 — Model explaining the stockperson’s influence on the welfare of the animals and their productivity (Hemsworth and Coleman, 1998).](image)

In a study performed on veal production in France (Lensink et al., 2000a, 2001b), the attitudes were measured of veal farmers towards their calves. In Europe, most of the veal farmers are affiliated with a veal company, which provides them with calves, foodstuff and management advice. Despite these standardised conditions, substantial differences are found in growth of calves or mortality between units affiliated with the same veal company. According to the theory of Hemsworth and Coleman (1998), this variability in productivity between farms might be due to the farmers’ behaviour towards their animals, which in turn depends on their attitude towards animals. In this study, fifty farms affiliated with the same veal company were studied. The farmers’ behaviour with the calves was observed during one morning meal, and the farmers were asked to fill in questionnaires designed to measure their attitude towards calves, and to obtain information about their background (e.g., age, gender, level of education). The productivity results (daily weight gain, feed conversion, and mortality rates) were obtained from the veal company. The study showed that the frequency of gentle contacts was positively correlated with the description the farmers made of their behaviour with the calves and their beliefs about the sensitivity of calves, confirming therefore the link between attitudes and behaviour towards animals. However, other variables showed to be important. For example, female farmers showed a more positive behaviour towards the calves, had more positive beliefs about the importance of contacts with calves, and made a more positive description of their own behaviour. Furthermore, stockpersons on bigger units showed more positive beliefs about the importance of stockperson’s behaviour on the success of the farm, despite giving less positive contacts to the calves. These results indicate that other factors might be important like gender or work load which can influence the link between attitudes and behaviour.
Coleman and Hemsworth have taken into account mainly the cognitive and behavioural components of attitudes. Other researchers have studied the more emotional side of the stockperson (e.g. empathy) or the personality of the stockperson (Seabrook, 1972, 1984; English et al., 1991). Seabrook and colleagues studied the relationship between personality traits of the stockperson and productivity of dairy herds in the United Kingdom. High and low-producing stockpersons were found to differ in a number of personality attributes, with e.g. high producing stockpersons reported as being: "not easy going", "patient", "unsociable", "independently minded", "not talkative", or "uncooperative". These studies did not clearly indicate what the relationship exactly was between the personality and the productivity differences, if these personality differences had their effect by the stockperson’s contacts with the animals, or whether they were associated with differences in technical competence or management practices.

6 Human-animal relationship in organic animal production

As pointed out, the human-animal relationship is very important in conventional animal production, affecting both the welfare of the animals and the farm productivity (and therefore the economic) results. What about the human-animal relationship in organic production? The organic production in Europe has to deal with European legislation (document 399R1804, 1998), which states that "systematic operations which lead to stress, harm, disease or the suffering of animals during the production, handling, transport and slaughtering stages should be reduced to a minimum". This is clearly too little to really define a clear relationship between stockpersons and their animals.

At first glance, the organic animal production seems not that different concerning the human-animal relationship. Basically the same handling procedures are applied to the animals in which humans are involved, like feeding, moving animals, milking... However, probably less medical treatments will be given to the animals because of a better animal health originating from organic farming "demanding less" from the animals. These medical treatments can be considered as often "negative" to the animals, including generally restraint of animal and application of injections with medicaments. Therefore, organic farming could present a potential benefit for the human-animal relationship by lowering the animal's fear of humans. However, Boivin et al. (2000) pointed out that organic productions systems tend to be more extensive, which minimises the contact between the animals and the stockperson, especially in outdoor conditions. This might result in increased aggressiveness and handling problems as found for outdoor-reared calves, who showed a heart rate that was significantly higher when a human approached and touched them and showed more aggressive acts towards the human, compared to indoor-housed calves (Boivin et al., 1994). It is probably necessary to provide positive contacts early in life and regular presence during the whole life of the animal to avoid these handling problems. Furthermore, a genetic basis exists for the animal response to human and there is a possibility to select animals on these criteria. As pointed out Boivin et al. (2000), in organic farming, the use of local, often rare breeds might interfere with possible handling problems. It can be imagined that the local breeds are well adapted to the sometimes harsh conditions in certain areas, but that these animals have not always been selected on their reactions to humans. Therefore, care should be taken with the choice of the animals and its possible effect on human-animal relationship.

7 References


