HOW ANIMAL HANDLING INFLUENCES ANIMAL BEHAVIOUR

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Introduction

Animal handling is a part of all animal production systems. There is, however, considerable variation in the frequency and the purpose for animal handling. Dairy cows, for example, are routinely handled twice a day for milking, while beef cows may only be handled a few times per year. Movement from one pasture to another represents a simple form of handling. Restraint and upending in a tilt squeeze is closer to the other extreme. Nevertheless, all types of handling involve controlling the behaviour of the animal in some way. This review will discuss some of the features of animal handling and handling systems. A comprehensive review of animal handling has recently been published (Grandin, 1993a), including a chapter on the behaviour principles of handling (Gonyou, 1993). The reader may wish to consult those publications for more detailed discussion of the topic.

Goals of Animal Handling

Animal handling involves moving animals, applying a physical treatment, or both. Animals are typically restrained in some way during the application of the treatment. Most procedures involve both movement and restraint, and so it is necessary to not only initiate locomotion, but also to stop it. For example, weighing an animal usually involves moving it to a weigh scale, restraining it on the scale, and then moving it back to its pen.

The benefits of any handling procedure must be weighed against its costs. The economic costs of handling include labour, facilities and equipment, and productivity losses. In addition to the economic costs, handling involves an ethical component related to the stressfulness of the procedure. We should be prepared to increase the cost of facilities, equipment and labour if, by so doing, we reduce the stressfulness of the procedure.

The Problems of Animal Handling

As indicated earlier, animal handling involves control of the animals’ behaviour. The problems involved in animal handling are not primarily physical, but psychological. Physical means are used only to induce the appropriate behaviour response.

How we (humans) communicate or should communicate with animals is poorly understood or developed. Some signals appear to have an intrinsic value. Pigs are less fearful of squatting than standing humans (Hemsworth et al., 1986). Dogs naturally respond to short, repeated rising notes with more activity than to long descending notes (McConnell, 1990). Being aware of such signals, and gaining understanding of these signals, is part of the process of turning stockmanship from an art into a science. More complex communication is possible as with voice or physical commands given to a horse, a dog or a dolphin, but it is based on extensive training.

One of the greatest challenges in handling animals is to avoid fearful reactions. The transition of an animal from being calm and easy to handle, to being frightened and out of control can be rapid. And once frightened, it is difficult to return an animal to a manageable state. Although fear is a potent means of moving an animal, it is counter-productive when it comes to regaining control to direct that movement or restraint. Keeping animals in groups as much as possible is one means of controlling fear, which is often induced by isolation in unfamiliar surroundings.

Components of an Animal Handling System

For the purposes of this discussion I will consider animal handling systems to consist of facilities, equipment, and personnel. Facilities are more or less permanent or fixed structures and are generally used to handle groups of animals. Equipment is more portable, is generally used to handle individual animals, and is often specialized in terms of treatments applied.
Facilities

Handling facilities are generally designed to facilitate movement of groups of animals. These include alleys, crowding pens, chutes etc. Facilities should be designed to facilitate movement in the desired direction, and prevent animals from turning back. Personnel may be able to physically control the movement of individual animals, but flocks or herds are best controlled by well designed and constructed facilities. Part of maintaining control over the animals is to reduce distraction by irrelevant stimuli. Solid walls should be used along all passages animals are to be moved along.

Animals move best in groups if they are able to maintain social contact. More animals can be moved down an alley that is the width of 3-4 animals, than through a single chute (Hutson and Hitchcock, 1978). Movement is also facilitated if animals are moving slightly uphill and toward a well lit area. Preventing the reversal of animals involves keeping the forward path open, and closing the return. A common error in the design of facilities is the failure to include gates or panels to prevent the return of animals to their pen should they escape past the handler. A second problem is that handlers fail to make use of these gates. Such an escape not only requires returning to the pen to start over, it also raises the excitement level of the animals, making them susceptible to fear.

Although wide alleys are usually more efficient to move animals, it is possible for animals to turn and reverse direction. Animals are particularly likely to do this when there is a point of transition in the environment. For example, the movement from a room into a hallway, around a corner, from one floor surface to another, or from outside into a weigh shed, are all likely to cause animals to hesitate, bunch up, and attempt to turn. In situations such as these, it is better to use a single file chute (Hutson and Hitchcock, 1978). The chute should allow animals to maintain visual contact with the animal ahead, through the use of gradual curves rather than corners. If animals must pause in a chute, as when waiting for another animal to be processed in a squeeze or scale, some provision should be made to prevent backing up. Permanent boards placed at hock height allow sheep to step over them while moving forward, but deters backing up (Hutson and Butler, 1978). Bars at hip level are often placed behind cattle as they are held in a chute. Narrowing the bottom of the chute deters animals from trying to turn around even if the chute is too wide to prevent turning.

Although handling facilities are a critical part of any livestock system, they are often overlooked during the design process. Hallways and holding pens are rarely designed with the animal in mind, and the need for retrofitting buildings is great. Part of the reason for this is the difficulty in conducting necessary research. Facilities are expensive, and a factorial study of facility design would be costly. The greatest research effort on handling facilities has been that on sheep in Australia (e.g. Hutson, 1980). Van Putten and Elshof (1978) studied various features of handling facilities for pigs. Much of our knowledge about livestock handling has been derived from consultants while working on projects (Grandin, 1993b)

Equipment

Equipment may be hand-held or fixed in the facilities, but is generally used to handle individual animals. When moving pigs it is very useful to use a herding board. This solid wood or plastic device can be used to close an opening if the animal tries to escape past the herder. Although buggy whips or canes have traditionally been used for the same purpose for cattle, a broomstick with a pom-pom on the end is more effective as a visual tool.

Equipment is often used to restrain animals. Cattle squeezes need to be properly designed to hold the animal while it is being worked on. Scales should be placed well inside the building so that they are not part of the transition of entering from outside. Restraining equipment must be strong enough to withstand the escape attempts of the largest animal.

The use of some equipment is aversive to animals. Occasional shocks from an electric prod can affect the productivity of pigs (Gonyou et al., 1986). Sheep form a strong aversion to the electric immobilizer (Rushen, 1986). The use of such aversive techniques continues to be debated. It is argued by some that electro-immobilization of deer is less stressful because of its effectiveness, than conventional restraint which results in considerable thrashing about. The answer to this debate will require testing in specific species. Whatever the outcome, it would appear that better restraint equipment is needed for non-traditional livestock.
**Personnel**

The most important part of a handling system are the persons who handle the animals and operate the facilities and equipment. Hemsworth (1994) advocates a training program for all stockpersons which emphasizes the effects poor handling can have on animal productivity and welfare. Personnel need to be familiar with animal behaviour, and be able to recognize an animal before it turns back or attempts to escape. The potential of well designed facilities and equipment will only be realized if the stockpersons use them properly. But perhaps the greatest attribute for a stockperson is patience. Over-reaction by handlers is one of the most common reasons for animals to become frightened or to try to escape.

The risk of poor stockpersons handling livestock, as well as labour costs, has contributed to the development of mechanized handling systems. The Australians have developed mechanized shearing. Also, milking robots allow cows to be milked without human contact. The Danes have developed a mechanized system of moving pigs through the holding pens in slaughterhouses that avoids the excitement caused by handlers. The result is fewer quality problems in their pork. Although we may cling to the idea that stockpersons are loved by their animals, the consistency of robotic systems may ultimately result in better handling.

**Conclusions**

Handling is an important part of any livestock operation. The costs of poor handling remain hidden as relatively little research has been directed to this area. Understanding the reaction of animals to their environment is a critical part of improving handling and requires continued research on animal behaviour. Efforts in this area will not only yield economic rewards, but will also improve the welfare of the animals.

**References**


