

Water Buffalo Handling: Property to Abattoir

Part 1. General Principles

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INTRODUCTION

Although some feral water buffalo are still caught for meat in the Northern Territory (NT), the trend is fast moving to better quality farmed buffalo for meat production.

Buffalo meat markets demand quality (TenderBuff®, Brunei supermarkets or Indonesian feedlots). As a result, there is greater emphasis on individual animal performance by meeting the required specifications, thereby minimising costs to increase income.



There are many aspects of management, which can affect profit, such as:

- Breeding
- Nutrition
- Handling
- Infrastructure.

This series of Agnotes emphasise the handling aspects of buffalo, although there will be many similarities with other meat species.

Prior to the 1990s, most buffalo meat came from feral animals, with only two cuts, eye fillets and scotch fillets. However, the nature of feral animals dictates that meat quality will be highly variable between individual animals depending on the stress imposed, the age of the animal and the energy used in the process of capture.

With the increase in buffalo farming operations and the higher costs of production, it is imperative that producers produce exactly what the market requires to obtain the highest price.

The NT Buffalo Industry Council and the Northern Territory Government have jointly promoted the quality assurance of buffalo meat with the registered trade name “TenderBuff”. The meat must pass five selection criteria that ensure a good eating experience, including the age, weight and fatness of the animal and the pH of the carcase and its electrical stimulation.

To achieve all five criteria within specifications, the producer must produce young, well grown buffalo that are quiet, tractable and comfortably go through mustering, transport and abattoir processes.

Handling of the animal has a significant impact on these criteria to the extent that poor handling and management can cause up to 60% discounts on the premium price paid to the producer.

Buffalo in the past have had a reputation of being able to withstand rougher handling than cattle. Because buffalo have a much thicker hide than cattle, they tend to show less bruising than cattle.

As domesticated buffalo herds increase throughout Australia, there is a need to improve their handling and management so that a greater proportion of the turnoff is suitable for the highest-priced markets.

The production of consistent table quality tender buffalo meat (TenderBuff®) requires improved husbandry, handling techniques and transport, as well as good abattoir pre-slaughter and post-slaughter management.

This Agnote series describe the benefits of good handling and transport and how it can impact on the eating quality of the final product.

EATING QUALITY

Toughness in meat is influenced by:

- Age of the animal – connective tissue toughness increases with age.
- Chiller cold shortening of muscle fibres.
- The ultimate pH of meat.
- Growth profile and animal condition at slaughter.

Age-induced toughness basically relates to the amount and composition of connective tissue. This increases with age and becomes important in grilling/frying cuts as the cooking time is not sufficient to tenderise connective tissue. Wet-cooking and slow-cooking methods can reduce connective tissue toughness. Young animal's connective tissue (layers between muscles) are more suitable than adult animals so are automatically more tender.

Cold-shortening toughness is caused by contraction of muscle in the chiller if the temperature of deep muscle drops too quickly before rigor mortis sets in (10-14 hours). No ageing (extended hanging time in the chiller) will counteract this toughness. This may be prevented by electrical stimulation at slaughter or tender-stretching during chilling. Electrical stimulation causes rapid onset of rigor mortis – in two hours. As muscles cannot contract after rigor mortis, electrical stimulation reduces cold shortening.

Ultimate pH is dependent upon the amount of glycogen (muscle energy reserve) in the muscle at slaughter. This glycogen is converted by enzyme action to lactic acid. If the pH (acidity) falls below 5.8 with ageing, then the meat usually becomes tenderer. This is because the presence of the lactic acid causes breakdown of some of the protein linkages between muscle fibres and also enhances keeping quality. This tenderising process occurs as the meat ages and is the basis of vacuum packaging, which allows this process to continue without bacterial spoilage.

An animal which has grown rapidly without heavy setbacks in the growth pattern will produce more tender meat than an animal which has grown slowly or had several setbacks at some time before slaughter. This is due to the animal having a higher body weight for age; in other words, a lower age for a given turnoff weight. As connective tissue increases toughness with progressive age, meat of a younger animal at a given live-weight will be tenderer. To achieve rapid growth with no setbacks requires good lifetime nutrition. This will not be dealt with further here, as we will discuss how to make the most of the grown animal.

STRESS

Stressed cattle or buffalo prior to slaughter will have lower muscle glycogen reserves. This will result in less lactic acid in the muscle and a higher pH. Hence the meat will be less tender. Lactic acid production continues for a period of around 24 hours post-slaughter and then stabilises.

At pH 6 or above, the meat is usually tough. Below pH 5.8, it is satisfactory for vacuum packaging, whilst at pH 5.4 it is very tender. Buffalo meat with a high pH will have darker coloured muscle. The calmer the animal is at slaughter, the tenderer its meat will be. The picture becomes complicated above pH 6.2 as tenderness actually increasing between pH 6.2 to pH 6.6, due to protein breakdown. The keeping quality of meat above pH 6 is quite short and meat in a vacuum bag will quickly change to unappetising colours (greens/purples). It must be frozen immediately so the value of the vacuum packaging for aging is negated.

Pre-slaughter stress can be due to many factors, including increased human contact, a prolonged or difficult or very rapid muster, too much yard activity, a strange new environment, being mixed with strange stock, lack of feed and water, and a rough or dusty ride to the meatworks, or fighting with other stock. It basically reflects treatment within the last 48 hours prior to slaughter.

Reducing pre-slaughter stress is best achieved by training stock earlier in life, by regular human contact, a proper weaning regime and frequent working through yards, (maybe an intra-station truck ride as weaners) to get animals used to transportation and quiet handling throughout life. Then consistent handling at the abattoir through to the knocking box, will not unduly stress animals.

Feedlot finishing for a few weeks may confer nutritional advantages, depending on the length of time on feed; but perhaps a more significant benefit could be quieter, less stressed animals at slaughter, because of increased and closer human contact, and associating humans with food.

DIFFERENCES BETWEEN BUFFALO AND CATTLE

Buffalo are innately more docile than cattle if treated properly from an early age. They can also be more dangerous than cattle if treated badly, due to their horns and size. Basically, they tend to be less timid and less likely to retreat from danger and will face up rather than retreat when challenged or put under pressure.

Buffalo have fewer sweat glands than cattle, so they are more prone to overheating due to over-exertion. This needs to be recognised in the siting of traps and yards, mustering distances during hot periods and methods of mustering, such as helicopters, vehicles or horses. When helicopter mustering, water must be available immediately to cool down animals. Mustering in the cool of the day is the recommended practice. Break the muster down into several stages if long distances are involved, leaving animals in shady, watered areas for a rest before moving on.

Buffalo behave differently to cattle when worked through yards. They appear to have better memories than cattle. They tend to balk and back up more than cattle and are harder to get going if they decide they do not want to go - that is, they are more stubborn. The more they are stressed, the more stubborn they become. Buffalo are more wary than cattle of head bails, even after just one experience. The implications of this are that buffalo should be handled expertly from the start. They should be handled in good yards and in smaller numbers through yards in a day than could be expected with cattle under similar conditions.

Much depends on previous handling. However, stock handlers need to recognise the flight zone distance of each individual animal and work from there. Intruding too far into the flight zone elevates stress levels and makes the animal's movement more unpredictable. Often, the most common cause of problems is that the person is just too close.

YARD DESIGN

Most good cattle yard designs also work well with buffalo. Revolving gates that are lined and are not see-through, work well in moving buffalo from a yard to a race.

Circular designs are generally more user-friendly, causing fewer problems in handling.

The most common mistake is to pack stock into a yard so that there is no free space. A good rule is to fill a pen or yard to no more than one third of its total capacity. That then leaves the handler plenty of space in which to manoeuvre and position animals for the best movement direction and speed. As a rule, if the animal is moving faster than a walk, it is probably under duress and less likely to react rationally.

Yard design becomes less of an issue as handlers understand that they are usually the greatest cause of animal bad behaviour and learn how to modify their methods and thinking.

Loud shouting, noise, prodding, poking, poly pipes, electric jiggers are not necessary when moving buffalo.

The best recommendation is that all handlers should attend low-stress stock handling courses to learn the basics of animal handling, so they can understand and respond to the animals' basic instincts, reactions to stimuli, positioning of the handler and mustering methods.

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