

## TenderBuff® Guidelines for Production

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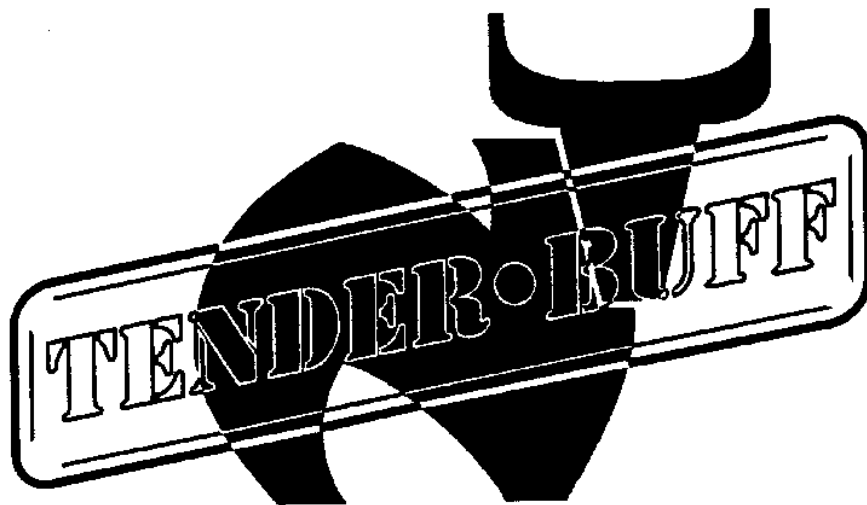
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### INTRODUCTION

The TenderBuff® program was initiated by the Northern Territory Buffalo Industry Council (NTBIC), to provide quality buffalo meat, which was registered under that name. It offered purchasers a quality-checked product by an independent assessor who strip-branded carcasses to guarantee they met all specifications.

TenderBuff® became an established product in the market, particularly in Darwin. It became popular with restaurants, hotels, caterers and the general public as an alternative to beef and other red meats. However, it has not been available in the Darwin market for several years due to the absence of a local abattoir.

TenderBuff® has nutritional qualities which give it a marketing edge in today's more nutritionally-conscious society where fat and cholesterol tend to be avoided where possible. It has significantly less fat, it is less prone to marbling and has approximately 43% less cholesterol than beef.



The essential characteristics of a buffalo for producing TenderBuff® is that it be young, well grown and in good condition with an even layer of subcutaneous fat. Moreover, buffalo need to be properly handled during mustering, transport and at the slaughter venue to avoid stress. Stress can significantly lower carcass quality due to a rise in muscle pH.

It is expected that TenderBuff® will eventually be available fresh in all Australian mainland states throughout the year once a suitable processing facility becomes available in, or close to, Darwin.

Restaurant quality buffalo meat has been produced through grazing animals on improved tropical or temperate pastures, or by using a grain and protein supplement with a suitable roughage in a paddock or a feedlot.

Feed-lotting can be used as a short term option but needs to be based on low cost by-product materials, such as bananas, sugarcane, or other horticultural waste produce. A producer may also use home-grown hay. In southern states, where grain may be a lot cheaper than in the Northern Territory (NT), lot-feeding may be more economic. There may be other opportunistic situations where a feedlot would be viable, such as using cheap stock that do not comply with specifications, such as recently captured feral young heifers or bulls.

### **Market requirements**

Consistent tenderness, juiciness and flavour are the main quality factors markets demand in premium buffalo meat. TenderBuff® is low in fat compared with beef and is therefore ideal for health-conscious persons who enjoy red meat with good levels of iron and zinc.

### **Advantages of TenderBuff®**

Only about 5% of meat from a feral animal can be sold as table cuts (i.e. fillet, striploin) but there is no guarantee of consistency in meat quality from one animal to the next due to age, condition and pre-slaughter handling. The advantage of TenderBuff® is that most of the meat can be used as table cuts because of the improved quality of the lower-value cuts. This raises the value of the whole carcass. The age of the animal is of paramount importance in ensuring tenderness of the meat. This is controlled by the dental specification. Stress, which causes meat toughness, is checked by measuring muscle pH post-chilling. Fat specifications ensure that animals have been on good nutrition. Electrical stimulation of carcasses at the abattoir ensures that cold-shortening of muscles does not occur in the chiller, ensuring meat tenderness. Meat tenderness is therefore ensured by the animal's age, minimum stress during transport to the abattoir and electrical stimulation of the carcass.



**Figure 1.** A prime example of a TenderBuff® carcass ready for boning out and vacuum packaging

## **GRAZING SYSTEMS**

It is possible to produce buffalo in the NT that will comply with TenderBuff® specifications on improved pastures. The Top End can supply TenderBuff® strip-branded carcasses all year round using the following pastures.

### **Fertilised upland improved pastures**

Mixed grass-legume, legume or grass-only pastures are all suitable for producing young buffalo to meet TenderBuff® specifications from December to July. Generally, a minimum of two to three months are required on green pasture to produce minimum fat, starting with an animal in store condition. The total time needed depends on the weight and condition of the animal at the start of grazing. Top live-weights of around 450 kg can be achieved in TenderBuff® swamp buffalo in two to two and a half years at proper stocking rates. One animal per

hectare is generally sustainable on annually phosphate-fertilised pastures in all but poor rainfall years. Live-weight gains of 0.8 to 1.2 kg/animal/day have been regularly achieved in the wet season. Crossbreeding swamp with riverine buffalo has also helped achieve this target weight much more rapidly through faster animal growth and increasing meat tenderness. The time crossbreds take to achieve target weight may be up to a year less than by swamp buffalo.

### **Floodplain improved pastures**

Floodplain improved pastures can sustain continued growth and live-weight gain in buffalo later in the dry season when stored moisture produces green feed until the next wet season storms. Natural or artificial ponding of water to differing depths also helps to provide continuous green feed. Pasture species that are useful on flooded areas include native hymenachne, Aleman grass and para grass, while *Kazungula setaria* and Tully are suitable on drier floodplains early in the dry season. Some other natives, such as *Pseudoraphis spinescens*, *Leersia hexandra* and *Paspalum* sp. may provide reasonable nutrition when green. Live-weight gains of 0.4 to 0.9 kg/animal/day may be achieved but so far have not been confirmed by trial work. High live-weight gains of up to 1 kg/animal/day have been achieved on these pastures after the first wet season storms in September if sufficient rain (i.e. >30 mm) is recorded.

### **In southern states**

Many temperate pastures containing legumes or legume/grass mixtures and stubble-based grazing are highly suitable for buffalo. In winter, producers may need to supplement buffalo with a suitable roughage hay to help cope with highly digestible green clover and sub-clover with a high water content. Buffalo appreciate grasses with a high roughage content and have been known to clean up some water weeds and bulrushes in dams and irrigation channels, which are normally not eaten by cattle.

## **SUPPLEMENTARY OR LOT- FEEDING SYSTEMS**

### **Purpose of pre-slaughter feeding**

Under extensive native grazing, animals tend to have variable condition scores and are easily stressed when mustered. A pre-slaughter feeding program ensures that animals receive proper nutrition to attain the carcass specifications and meat quality desired by the market. Moreover, this helps the animals to quieten down, which helps to minimise stress at slaughter, which is important for meat tenderness and shelf life.

### **Class of animal**

Buffalo bulls or steers weighing 250 to 375 kg (12 to 24 months) are ideal for high quality meat production. It is likely to be uneconomic to condition lighter animals, while older animals tend to have tougher meat, which cannot be significantly improved by better feeding. Heifers can also be used but tend to grow at slower rates and carry more fat than bulls or steers at the same age and weight.

### **Feeding program**

Buffalo are able to utilise relatively low quality roughage (4% protein) more efficiently than cattle. The advantage of this is that the bulk of the ration may come from relatively cheap feed sources compared with the high grain rations that are needed to fatten cattle. High grain diets in buffalo (i.e. >65% of ration) may not be as efficient in realising live-weight gains as do lower level grain/roughage-based diets.

However, buffalo still require protein and energy supplements to achieve high growth rates and desirable carcass characteristics. They should be fed conditioning rations for at least 60 days before slaughter if pasture feeding is not sufficiently strong. Our studies have shown that it can take up to two weeks for animals to get on to full feed and 45 to 60 days on the full ration to achieve prime condition.

## Ration formulation

Diet component	Testing ingredients	Daily allowances per animal
Basal diet	Pangola or rice hay	Ad libitum (approx. 7 to 8 kg)
Supplements:		
a) Energy	Cracked maize, cracked sorghum, cracked whole rice	2 kg 2.4 kg
b) Protein	Cotton seed meal or copra meal	0.5 to 0.75 kg
c) Minerals	Salt based block *	25 g

\* There is no advantage in feeding blocks containing urea.

## Basic feedlot management practices

- Separate animals into weight groups according to turnoff interval.
- Before the start of a feeding program treat animals for external and internal parasites and vaccinate against clostridial diseases. If scales are available, record live-weight. Weigh again at least fortnightly to monitor performance.
- Hold animals in yards or small holding paddocks adjacent to yards, where there is no disturbance.
- Shy feeders will regularly need to be segregated early from the main group or they will not gain weight. They are easily recognised as they stand back away from feed troughs when food is delivered.
- All animals should have access to shade and water all the time. Clean wallows or sprinklers are beneficial in hot weather.
- Hay should be fed in hayracks and supplements in clean troughs off the ground. Ensure that there is plenty of room for animals at the feed (allow 45 cm/animal of trough space) and shelter the feed supplement from the sun and rain. Hay should also be sheltered from rain in the wet season. Troughs need to be cleaned daily.
- Supplements should be gradually introduced to the animal over the first week to avoid wastage. Thereafter, they can be fed daily or once every two to three days at the daily rate multiplied by the number of days. Chaffing the hay initially and mixing it with small amounts of grain and cotton seed meal (or other protein meals) and gradually increasing the quantity over a 10-day period to the full ration can be a useful method.
- Work animals frequently but gently and quietly through the yards. "Free runs" through the race without stoppages are a useful start to training.



**Figure 2.** A well-finished group of TenderBuff® animals prior to processing at the abattoir. The washing process has a calming effect with buffalo as well as removing skin contamination.

## ABATTOIR PROCEDURES

### Slaughter management

Finished animals should be transported to the abattoir with minimum stress the day before slaughter or by arrangement with the abattoir owner. They should have free access to drinking water. Where possible, it is best to use the people who have been handling the buffalo in the paddock or feedlot rather than strangers, to get them through the yards and quietly into the knocking box. This will reduce stresses. Immediately after slaughter, carcasses should be electrically stimulated within 10 minutes to hasten rigor mortis and to prevent cold shortening of muscles in the chiller. This is particularly important in buffalo because of the absence of a good coverage of subcutaneous fat. Cold shortening is one of the prime causes of toughness in meat in efficient modern chillers due to the quick lowering of temperature before rigor mortis sets in and stops shortening of muscles.

### CARCASS SPECIFICATIONS FOR TENDERBUFF®

1. Carcass weight of 150 to 300 kg.
2. An even distribution of creamy white, firm fat over the carcass, measuring in depth from 3 to 12 mm over the p8 site (rump).
3. No permanent teeth (average age is less than 2.5 years).
4. Electrically-stimulated carcass within 10 minutes of slaughter.
5. Ultimate muscle pH to be less than 5.8, measured after the carcass has been hung overnight in the chiller (18 hours post-slaughter).

### Post slaughter treatment

Carcasses should be hung in chiller rooms at below 7 °C as soon as possible after slaughter. The carcass can be aged over 10 days when stored at 5 °C, or over three to four weeks at 0 °C. This has the effect of tenderising the meat. Vacuum packaging or Cryovac® extends the storage life of chilled meat cuts and permits aging to occur without spoilage or discolouration. Under optimal processing conditions, vacuum-packed meat can be stored at 0 °C for 12 weeks or six weeks at 5 °C. Because of the darkening of muscles due to exposure to the air in the chiller, carcass aging is not recommended for TenderBuff® mainly due to the wastage involved in removing the darkened surface layer and dehydration of muscle. This is due to the absence of extensive sub-cutaneous fat in young buffalo, which is normally present on beef carcasses. Vacuum packaging for a minimum of two weeks is the preferred option. Vacuum packaging is best carried out as soon as possible after delivery (within one to two days) rather than leaving the carcass hanging in the chiller for long periods before vacuum packing. This reduces the likelihood of spoilage and off-flavours, which may develop within the bag.

### Trade descriptions

Apart from mandatory AUS-MEAT descriptions of meat products required on all packaging, supplementary information can be used to identify high quality buffalo products, such as 'lot-fed' or 'TenderBuff®'. However, since NTBIC has an approved trademark, which guarantees the quality of meat for consumption, producers are encouraged to register their operation with NTBIC so that its brand can be used as a mark of consistent quality. Look up "The "Australian Water Buffalo – Selected Meat Cuts and Information", which has been produced for the Australian Buffalo Industry Council by RIRDC and contains all the relevant descriptions.

## FURTHER READING

Agnotes J63, J64 and J65 Water Buffalo Handling: Property to Abattoir.

"Australian Water Buffalo – Selected Meat Cuts and Information". First edition 2002.

Rural Industries Research and Development Corporation, Canberra, Australia.

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