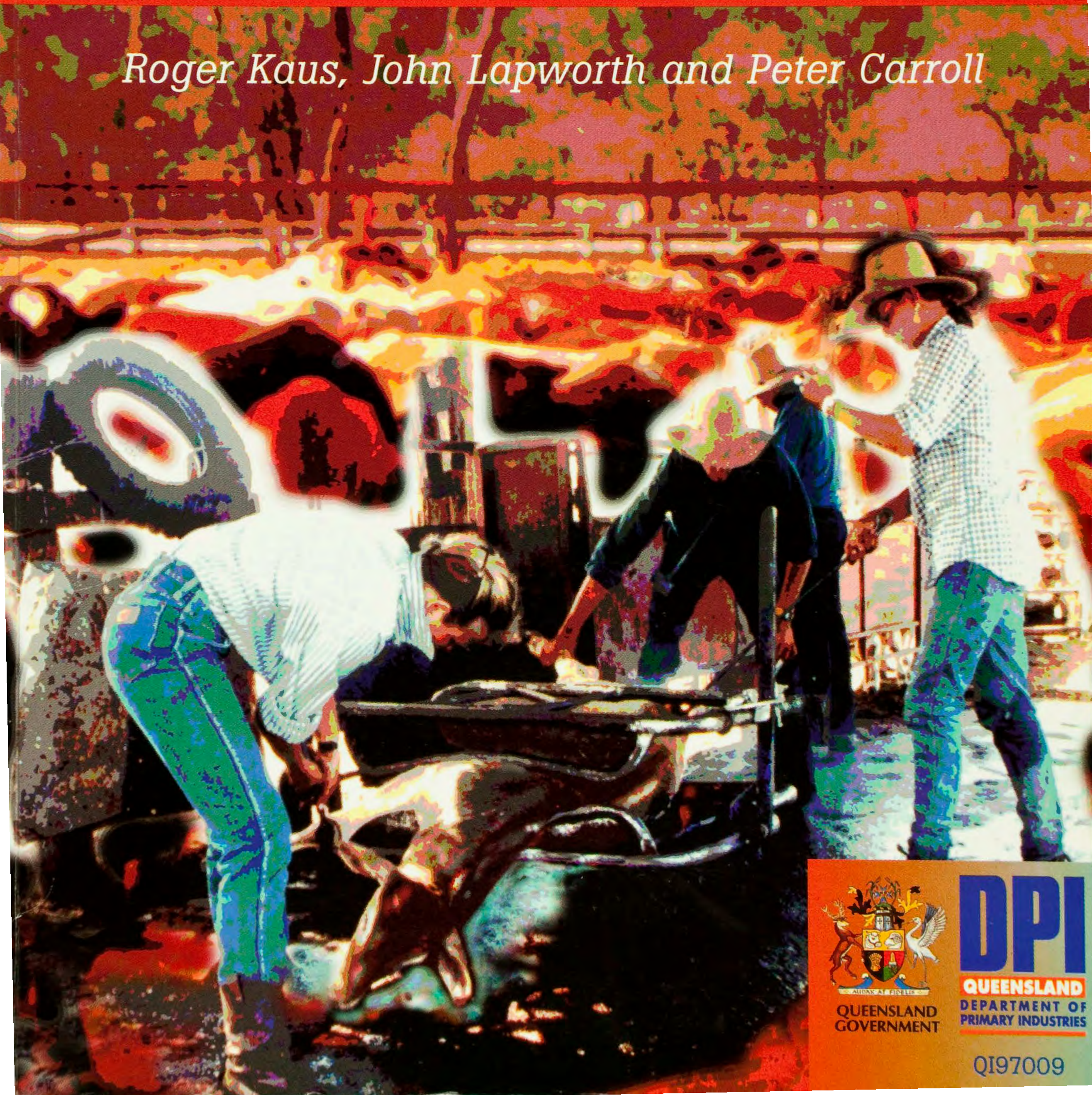


6th edition

The Stockman's Handbook

Roger Kaus, John Lapworth and Peter Carroll



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The Stockman's Handbook

Sixth edition

Compiled by

Roger Kaus, John Lapworth and Peter Carroll

Department of Primary Industries
Queensland



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Foreword

Australia is the world's largest exporter of beef, and Queensland is Australia's leading beef-producing and exporting State. With approximately 9.7 million beef cattle and an annual production value of about \$1.2 billion, beef is one of the State's major primary industries. The Department of Primary Industries is dedicated to assisting the Queensland beef industry to significantly expand its export income from processed beef and live cattle to all markets worldwide.

The industry is constantly changing, presenting enormous challenges to DPI and producers alike. Our joint efforts in northern Australia over the past ten years have resulted in major gains in production efficiency through the development and adoption of crossbreeding technologies, and improvements in pasture, cattle handling, breeding herd management and nutrition.

Today's challenges for the Queensland beef industry are many and varied. With technical input from a range of DPI officers and industry workers, *The Stockman's Handbook* provides beef property managers and stockmen with detailed practical information on a broad range of animal health and husbandry practices that affect stock across northern Australia.

We trust that *The Stockman's Handbook* will assist stock owners and managers, and the cattle industry as a whole, to respond to changing conditions and opportunities with professionalism and confidence.



Roly Nieper
DIRECTOR-GENERAL

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Beef cattle management



Managing breeders from first calving

Peter Smith, District Adviser, Charters Towers

The first factor in managing the main breeder group is to ensure that only heifers which successfully raise and wean a calf are selected. Management practices should then focus on maximising productivity and minimising losses.

Mating time

In a continuously mated herd, mating heifers to calve on time (that is, at the beginning of the wet season) will improve a herd's calving pattern over time. Good management of weaning and supplementation will maintain breeder condition and reduce the spread of calving.

Controlled mating is the ideal system, though on many properties this is not possible across the whole herd because of bull control problems and logistical issues. Controlled mating of particular groups such as maiden heifers and future culls can simplify their management.

Identifying sub-fertile breeders

To improve and maintain productivity, sub-fertile breeders must be rigorously culled. In continuously mated herds, identifying sub-fertile breeders is more difficult due to the spread of calving. Under extensive conditions, a breeder which fails to calve twice in three years should be considered sub-fertile. In practice this means that cows that are dry at the first mustering round each year should be pregnant.

Culling empty wet cows is not recommended because this group generally has low pregnancy rates, and lactating cows seldom attract good prices due to their lack of condition.

Pregnancy testing

Pregnancy testing is the most direct means of identifying cows which fail to conceive. However, pregnancy testing will not pick up those animals

which fail to raise a calf, so it is best combined with an identification system, for example, numbered plastic ear tags.

Culling cows

Apart from poor fertility, cows should be culled if they develop poor temperament or faults which affect their ability to forage or raise a calf. Bottle teats are a common problem and culling for this defect should be strict, regardless of a breeder's performance or quality.

Many cattlemen cull smaller or lighter cows without considering their reproductive history. However, work by the Department of Primary Industries and CSIRO in Central Queensland found that good reproduction had a major impact on cow size. For example:

- Cows producing 3 calves by 5 years of age were 34% lighter than cows with nil calves.
- Cows producing 2 calves by 5 years of age were 20% lighter than cows with nil calves.
- Cows producing 1 calf by 5 years of age were 10% lighter than cows with nil calves.

This highlights the need to cull breeders primarily on the basis of their ability both to survive and to raise calves to weaning.

Nutrition

Northern Australia has relatively poor pastures with highly seasonal growth patterns. Phosphorus deficiency and dry season weight loss are major nutritional problems. Nutritional management is aimed at maximising wet season weight gains and minimising dry season losses.

Stocking rates. Adjusting stocking rates to available forage is essential to maintaining animal productivity and pasture condition. With moderate stocking rates cattle can select a higher quality diet and better maintain body condition.

Phosphorus supplementation. On deficient country supplementation produces higher calvings and lower losses. Supplementation should be commenced during the wet season or as soon as practical after it. Including low levels of urea in phosphorus supplements further improves breeder performance in the late growing season.

Dry season supplementation. Supplementation with urea-based supplements improves an animal’s ability to consume poor-quality pastures. Weight loss and deaths are reduced.

The use of high-quality energy and protein supplements for survival feeding of large mobs is usually not practical in extensive situations. Reducing stock numbers and adopting drought management strategies such as radical weaning will reduce drought losses in large breeder herds.

Weaning

In the northern environment reducing nutritional requirements is probably more important than trying to meet them. Lactation is a major stress over which some control can be exerted. Under poor seasonal conditions milk production and calf growth rates will be reduced.

Weaning dramatically reduces nutritional requirements of breeders, and therefore improves the breeder’s chances of surviving and conceiving. If calves are well managed, their growth rate will continue. The benefits of early weaning in difficult country have been documented by trials and practical experience. A continuously mated herd at “Swans Lagoon” produced an average branding rate of 83% over five years under a system of weaning twice a year at a minimum age of three months.

At “Blackbraes” Hughenden a trial demonstrated the effect of early weaning on conception rates and cow condition (Table 1). All calves were in the same age range. Half were weaned at first muster (early weaners) with the balance weaned at the second muster (late weaners).

Table 1 *Effects of early weaning on breeder and calf performance*

	Early weaning	Late weaning
Empty cow conception rate within 10 weeks of first muster	63%	20%
Pregnancy rate		
– first muster	18%	20%
– second muster	70%	36%
Weight change between musters		
– cows (kg)	–29	–55
– calves (kg/hd/day)	.25	.25

Early weaners require good nutrition and management or poor growth, coccidiosis and deaths will result. However, the logistics of early weaning can be complicated on large properties. While it may not be possible to implement the strategy across the whole herd, it can often be effectively used with particular breeder groups like first calf heifers.

Young cows with their first calf at foot

This section of the breeder herd has the lowest conception rates and the highest losses, because they are trying to grow, lactate and conceive at the same time. Northern Australian pastures often cannot meet nutritional requirements, and body reserves become critical to survival. First calf cows often fail to conceive, or conceive late and calve out of season. This reduces their chances of survival and causes management problems. Controlled mating of heifers and first calf cows will reduce the problem of out-of-season calves.

Heifers should be kept as a group, run in the best breeder paddocks, and managed so as to achieve good growth rates until their second calving. Segregation of these young breeders will ensure any additional management and supplementation will be as effective as possible. Dispersing heifers in the general breeder herd can result in poor heifer performance and higher heifer death rates.

Phosphorus and dry season supplements can play a major role in maximising and maintaining body condition in this group. Even if the main breeder group does not require dry season supplements, strategic supplementation of first calf cows should be considered. Early weaning can also be used to improve the performance of this group.

Cull cows and cows selected out for age

These cows comprise a third to half of female sales but in many cases returns per head are below potential. As a herd's productivity improves or if younger turnoff is adopted, the number of cows available for sale will increase. Consequently, maximising returns from these animals will become more critical to overall profitability. While seasons, markets and management constraints often restrict what can be done with culls, a number of options are available.

- Pregnancy testing can be used to identify empty cows which can be marketed immediately if their condition is suitable.
- Selling breeders as pregnancy-tested-in-calf (PTIC) cows can boost returns for quality cows if the store market is strong.
- Establishing a cull cow paddock or a depot (in the case of a company) enables cows to be calved out, finished and marketed to best advantage.
- Spaying to ensure culls are empty, or will not get back in calf.
- Cows sold after weaning often lack condition and usually return poor prices.

Conclusion

Good breeder management is critical to profitability. Key aspects of management are:

- identifying sub-fertile breeders
- ongoing culling
- maintaining body condition through good nutrition and weaning
- good heifer management
- improving first calf cow performance
- cull cow marketing.

Weaner management

Peter Smith, District Adviser, Charters Towers

Weaning is probably the single most effective management tool to reduce deaths in breeder herds and increase herd fertility. Good weaner management and nutrition will ensure continued weaner growth and the success of weaning management within the herd.

Weaning is a stressful period because weaners undergo a drastic change in lifestyle and diet. Improvements in weaner management are important because of the following factors.

- Weaner losses in northern Australian herds are unacceptably high (often 5–10%). Coccidiosis and weaner ill-thrift (failure to thrive) are common problems.
- Good weaner nutrition and management will reduce the large “tail” common in lines of northern cattle.
- To reduce turnoff age, major setbacks must be avoided at any stage of an animal’s life.
- Research work indicates that there is a link between weaner heifer growth and subsequent fertility.

Weaning age

When planning weaner management, weaners can be classified on the basis of their age and nutritional requirements (Table 2). Most weaners on North Queensland properties will fall into the normal category. Relatively few problems are experienced with these animals provided they are well fed and managed during the 10–14 days immediately following weaning. Intensive post-weaning management is usually not required. However, improved management, particularly of small and weak animals, will reduce losses and improve growth rates.

Early weaning has proved to be very effective in increasing calving rates and reducing cow losses in many areas of northern Australia. However, calves weaned early require high-quality supplements and good management to avoid poor growth, coccidiosis and deaths. The successful implementation of early weaning on large properties requires



Good weaner management will reduce losses in breeder herds and increase overall herd productivity.

Table 2 Classes of weaners

Class	Age	Weight
Normal	5 months +	150 kg +
Early	3–5 months	100–150 kg
Radical	1–3 months	50–100 kg

Careful planning because of the facilities and labour required, and the logistics of the exercise.

Although early weaning may not be feasible on a whole-herd basis, it is a useful option for assisting vulnerable breeder groups such as first calf cows. It also has a role in cull cow management because it allows more time for them to fatten, thus enabling them to be sold sooner.

Radically weaned calves require even more intensive management, and this option is best reserved for exceptional circumstances such as severe drought or where it is preferable to send dry cows on agistment.

Pre-weaning preparations

In order to minimise the stress of weaning, facilities and management must be well organised before mustering starts. The following considerations are important.

- (1) When planning mustering, allow adequate time for feeding and handling. Good handling takes time but results in fewer losses, better growth and more manageable cattle.
- (2) Putting weaner feed in the trough before catching the horses to go mustering is a good practice. Weaners with immediate access to feed and water following drafting will settle down sooner and suffer less stress.
- (3) Ensure adequate stocks of hay and supplements are on hand.
- (4) Order vaccines well in advance and check veterinary equipment.
- (5) If different classes of weaners are going to be handled, ensure there is adequate yard and paddock space so animals can be drafted and managed accordingly.
- (6) When supplements such as cottonseed meal or calf pellets are fed, provide 15–20 cm of trough per animal.

Weaner supplementation

Supplementary feeding is expensive and must be planned according to animal requirements and management objectives. Table 3 lists suitable supplements for different classes of weaners. This information is a general guide only, and managers should consider local conditions and experience when developing supplementation programs.

Key management practices

- (1) To minimise stress, weaners need to be on water and feed as quickly as possible on the day they are weaned.
- (2) Segregation of smaller and weaker animals as soon as possible will improve their performance. Small weaners should be observed regularly to ensure they are all eating well. Early attention to any sick or scouring animals will greatly reduce any potential problem.
- (3) Feeding protein meals and calf pellets on a twice-weekly basis reduces bullying.

Table 3 Weaner supplements

Weaner class, age, weight	Growth objective	Pasture quality		Yard feeding
		Good grass (maintenance)	Poor grass (sub-maintenance)	
Normal 5 months Over 150 kg	Up to 100 g/day	Urea blocks ad lib Dry licks (30 g urea/day)	Urea + TP blocks ad lib Dry licks + TP ad lib	Hay 1.5–2 kg/day
Early 3–5 months 100–150 kg	200 g/day	Cottonseed meal (.5 kg/day) MUP	Cottonseed meal (.5 kg/day) MUP	Supplement + good hay (1.5 kg/day)
Radical Under 3 months Under 100 kg	300 g/day	Calf pellets 16–18% CP 1–2 kg/day	Calf pellets 16–18% CP 1–2 kg/day	Supplement + lucerne hay 1.5 kg/day

Urea + TP blocks: Blocks which contain urea and 5–10% true protein
Dry licks: Urea-based licks
Dry licks + TP: Licks which also contain a protein meal such as cottonseed meal
MUP: Molasses + 3% urea + 10% protein meal and Rumensin
Good grass: Feed which has good leaf and colour
Poor grass: Feed which has little leaf and/or colour
Ad lib: Available at all times

- (4) If possible, a sample of weaners should be weighed so that their performance can be assessed. This will enable better management of supplementary feeding programs.
- (5) Accurate records of supplementary feeding are necessary to determine if intakes are adequate, and to evaluate the cost effectiveness of feeding.
- (6) Where a number of classes of weaners are being supplemented, they should be assessed every 2–4 weeks, and animals which are large enough moved to the next group. Similarly, animals which are doing poorly can be moved to a group receiving better nutrition.
- (7) Weaners should be branded, castrated, earmarked and ear tagged when they are let out of the yards. This minimises the possibilities of wound contamination.

Weaner paddocks

Weaner paddocks require secure fencing so the animals can be controlled and educated. In order to minimise the stress on weaners, watering facilities must be in good order and adequate for the number of animals. Hollows and boggy areas around troughs cause problems for small and weak animals, and should be filled in.

Although every property has established weaner paddocks, additional paddocks may be needed for the segregation and supplementation of smaller animals. Consideration also needs to be given to handling the extra weaners which will result from improved breeder performance.

To ensure good weaner growth and long-term productivity, pastures must be kept in good condition. Weaner paddocks come under considerable pressure because of the number of animals and their high level of activity. Paddocks need to be large enough and well managed. Weaner paddocks should not be used as a “dumping” area for sale cattle, bulls, horses etc.

Spelling paddocks over the wet season helps maintain pasture condition and ensures fresh feed for weaning. Managers should aim to empty weaner paddocks at the end of the cattle season. If seasonal conditions result in rank growth, control can be achieved with appropriate grazing management.

Vaccination programs

Botulism and tick fever vaccinations can be most efficiently given when weaners are branded. Previously branded but unvaccinated calves can be vaccinated as they are put into the weaner paddocks. Because young cattle are the most vulnerable to tick fever, it is recommended that weaners are vaccinated.

Animals being moved from tick-free to tick-infested areas will require a tick fever vaccination which should be given four weeks prior to movement or at the time of movement. Where animals are vaccinated at movement, it is advisable to keep them tick free for a month to ensure they are not challenged while immunity is developing.

Tetanus occurs on some properties and producers should be alert for signs of the disease. If tetanus is a problem, calves will require tetanus antitoxin vaccination at branding. Other weaner vaccination programs

might include vaccination against other diseases including leptospirosis, blackleg, pulpy kidney: 7-in-1 vaccine is recommended for areas where these diseases are a problem.

Dehorning

Successful dehorning requires good instruments and attention to detail. Because of the variations in calf age and horn development at branding, a range of instruments and sizes are needed to ensure all animals are effectively treated. Where only the horn bud is present, dehorning knives are very effective. It is important to keep dehorning knives sharp and other dehorning tools sharp and in a good state of repair.

There will always be some animals with horn regrowth and whenever weaners are handled, animals with regrowth should be drafted off and treated. The final drafting of heifers for mating is an opportune time to remove any remaining horns.

Parasites and predators

Young animals which are stressed are the most vulnerable to internal and external parasites. Avoiding unnecessary stress and ensuring adequate nutrition are therefore crucial to parasite control. Attention to parasite control is a high priority in the management of young or early weaners.

Ticks and lice

Weaners should be checked regularly for ticks and lice, and control measures adopted if necessary.

Worms

Traditionally, worms have not been considered a problem in the pastoral regions, though severe infestations have been found in north-west Queensland at different times. A problem is most likely to develop when weaners are fed in unhygienic conditions or where stocking rates are high on poor-quality feed.

Infestation can also occur where weaners congregate on areas of green pick such as creek lines, swamps or overflows from watering facilities. If worms are suspected, faecal samples should be taken for analysis by the Department of Primary Industries. Drenching programs can then be planned if necessary.

Coccidiosis

Coccidiosis is a type of severe scouring caused by protozoan organisms which invade and damage the wall of the small intestine. The disease usually occurs 4–6 weeks after weaning and is characterised by dark scouring and severe weight loss. Deaths are common and animals which survive may be permanently affected because of intestinal damage.

Stress and/or poor nutrition is the cause of the disease. Younger weaners are the most vulnerable because of their susceptibility to nutritional and other stresses. Since treatment on a large scale is difficult and expensive, the disease must be prevented by minimising the stress of weaning and ensuring adequate nutrition. As noted earlier, putting the feed in the trough before catching the horses is important.

Even if early weaning is not practised, the segregation and correct supplementation of smaller and weaker calves will reduce the likelihood of coccidiosis as well as improving their growth.

The rumen modifier Rumensin (active ingredient Monensin) mixed with high-quality supplements has proved effective in reducing the incidence of coccidiosis. The recommended dose is 15 mg Monensin/hd/day so very thorough mixing is required. This precludes its use on stations where mechanical mixers are not available. It can be included in calf pellets at minimal cost and its use at the above rate is recommended.

Any scouring animals should be treated immediately they are noticed. Early treatment will improve the success rate of the treatment and reduce the effect on the weaners and the spread of coccidiosis within the mob. Because coccidiosis is a continuing problem and is caused by poor nutrition and stress (usually at weaning time), it must be prevented by good management rather than relying on drugs.

Dingoes

Because of the vulnerability of weaners, special attention should be paid to control measures just before weaning as well as carrying out regular checks for dingo activity. Running a few older cows with the weaners may also be worthwhile.

Heifer management

Peter Smith, District Adviser, Charters Towers

Heifers deserve special management in northern Australia to improve calving rates, reduce mortalities, and improve herd productivity. To ensure maximum productivity, heifer management should begin at weaning. Heifers should be managed as a discrete part of the herd. “Bushing” heifers into the herd as yearlings or 2-year-olds will result in higher death rates of heifers lactating at the wrong time of the year.

Heifers should be run in a good breeder paddock, at least until their first calf is weaned. Segregation from the breeder herd until then allows more targeted management of heifers. Controlled mating, better dry season supplementation during first calving, and early weaning are some of the practices that are a high priority for this part of the breeder enterprise. Reducing death rates and increasing the reproductive efficiency of heifers will improve profitability by increasing brandings and female turnoff.

Attention to the selection and breeding of heifers will ensure steady improvement in the productive potential of the whole herd.



Heifer growth

Recent research has confirmed that the percentage of heifers which conceive at a particular weight can vary markedly between years. Researchers believe that the growth of heifers as weaners (that is, from weaning to the first growing season) has a critical effect on their later fertility.

The following table shows the variation in pregnancy rates of 2-year-old heifers which had grown at different rates following weaning. Although reasons for this variation are not fully understood, preliminary results indicate that maintaining heifer growth during their first dry season will boost fertility.

Table 4 *Relation of pregnancy rates to growth after weaning*

Mating weight	Dry season growth after weaning	
	– .1 kg/hd/day	+ .1 kg/hd/day
200 kg	21%	66%
250 kg	52%	80%
300 kg	82%	90%

Source Fordyce et al., “Swans Lagoon” Research Station, *Annual Report*, 1988.

Heifer selection

Heifers selected for mating should have:

- structural soundness
- good temperament
- target weight greater than 280 kg.

The critical factor in achieving good conception rates is weight. Heifers of 280 kg have an 80% chance of conceiving. Properties in North Queensland joining heifers of 300 kg or more achieve conception rates of 90%.

Joining time

Heifers should be joined so as to calve at the optimum time. A cow’s peak nutritional requirements occur about six weeks after calving, so

calving should occur at the beginning of the most reliable rainfall period. Timing a cow's peak nutritional requirements to coincide with pasture production maximises both calf growth and the cow's opportunity to gain weight and conceive again early in the season.

In North Queensland joining in February–July produces a November–April calving. Some cattlemen are concerned about November calves, but the peak of conceptions will occur approximately one month after joining. Consequently, the peak of calving will occur in December–January which is the ideal time. The timing in other regions should be determined from seasonal patterns and local experience.

If heifers are mated at the target weight, and gain weight during pregnancy, they will have good body reserves which will enable them to survive and rear a calf if the wet season is delayed. Heifers which calve at the optimum time have a much better chance of calving on time for the rest of their lives. Those calving out of season are likely to miss calving for a year and will suffer higher losses.

Joining age

Because heifer weight and time of joining are the most important factors in achieving good performance, these should be the major considerations in determining joining age.

In practice, this means that some heifers can be joined at 15–18 months but the rest should be held until they are two years old. Joining underweight heifers at 15 months often results in their reaching a suitable weight and conceiving in the second half of the year. These heifers then calve out of season and are at considerable risk.

While joining suitable heifers at 15 months (yearling mating) can maximise herd productivity, this group is particularly prone to nutritional stress and will require careful management. If yearling mating is practised, controlled mating is strongly recommended.

Joining management

In northern Australia a 5-month joining period is suggested for 2-year-old maiden heifers if controlled mating is undertaken. A 3-month mating period is suggested for yearling heifers. Mating more heifers than are

required for replacements and culling empty heifers following the mating period will ensure adequate pregnant replacement heifers calving at the right time. If controlled mating is not practised, pregnancy testing heifers mid year and culling empty and out-of-season calving heifers is recommended.

Bos indicus bulls are generally used at 5%, although more bulls may be desirable where cattle spread widely in small groups. To minimise reproductive diseases, new 2-year-old bulls should be joined to maiden heifers.

Culling heifers

Apart from culling for temperament or structural soundness problems, heifers should be culled on the basis of:

- failure to conceive, and/or
- failure to wean a calf.

Both can be regarded as heritable factors. Failure to conceive is moderately heritable in *Bos indicus* females, and animals which fail to raise a calf the first time are likely to fail again. Strict culling of heifers for performance results in only proven breeders entering the herd. This will improve herd fertility and reduce the rate of culling required in older breeders.

Pregnancy testing is a useful tool in heifer management because it quickly identifies infertile animals. Data on conception rates and patterns can then be used to plan management and identify disease problems. Selling empty heifers provides income and reduces grazing pressure prior to the most stressful part of the season.

Heifer numbers

Sufficient heifers should be joined so that after strict culling there are enough heifers left to maintain herd size. If culling rates in other breeder groups are increased, extra heifers will be needed. Herd modelling programs are useful for evaluating culling options across the breeder herd and determining the number of heifers required.

Conclusion

The heifer component of the herd provides opportunities for improved productivity, because it is an identifiable group whose performance can be lifted by using simple management procedures. Selecting heifers on the basis of their ability to raise a calf ensures that only productive animals enter the herd. Consequently, whole-herd performance will increase.

If the breeding and selection program is directed at improving the productive characteristics of the herd, heifers should be genetically superior to older cows. A little extra attention to this group will ensure steady improvement in the productive potential of the whole herd.

Bull management and selection

Rod Thompson, Geneticist, Townsville

Bulls are an expensive component of the herd and their performance, in terms of fertility and progeny growth, has a major impact on a cattle enterprise's profitability.

Bull requirements and costs

Bos indicus bulls are generally used at 5% in northern Australia. On small properties with restricted waters, 2½–3% may be adequate while up to 7% may be needed in large paddocks with difficult terrain or where cattle scatter in small groups.

The cost of bulls can be illustrated by considering a 1,000 cow herd in which bulls are used at 5% (Table 5). For this exercise it is assumed that bull mortality is 3.5% and 20% of bulls are replaced each year. Purchase price is \$1200 and sale price is \$600. An interest rate of 12% was applied to the capital value of bulls. The table indicates the high cost of producing a calf.

Table 5 Bull costs at different branding rates

Branding rate	Bull replacement cost	Capital value of bulls	Bull replacement cost \$/calf	Replacement cost plus interest \$/calf
60%	\$7048	\$46,427	\$11.75	\$21.04
70%	\$7048	\$46,427	\$10.07	\$18.02
80%	\$7048	\$46,427	\$8.81	\$15.77



Bull performance, in terms of herd fertility and growth rates of his progeny, has a major impact on the overall profitability of a cattle enterprise.

Joining and culling

Research work at “Swans Lagoon” has found that $1/2$ and $3/4$ Brahman bulls will usually reach puberty at an average weight of about 260 kg at about 18 months. Joining at two years will allow a bull to be used at an early age, achieving a quicker turnover of bulls or a greater rate of genetic progress. The recommended age at which to cull *Bos indicus* bulls is seven years.

Old bulls have a range of problems:

- Fertility begins to decline at five years.
- Testicular and penile lesions are more common.
- Older bulls are prone to carrying vibriosis and trichomoniasis.
- They are more difficult to handle and/or likely to be “lost”.
- Infertile older bulls can dominate fertile younger bulls.

Purchasing program

New 2-year-old bulls should be joined to maiden heifers as this reduces the potential spread of reproductive diseases. Sufficient bulls need to be purchased for heifer joining, replacement of 7-year-old culls and losses. An orderly purchase program ensures a young bull herd and avoids large purchases in any particular year.

Bull soundness

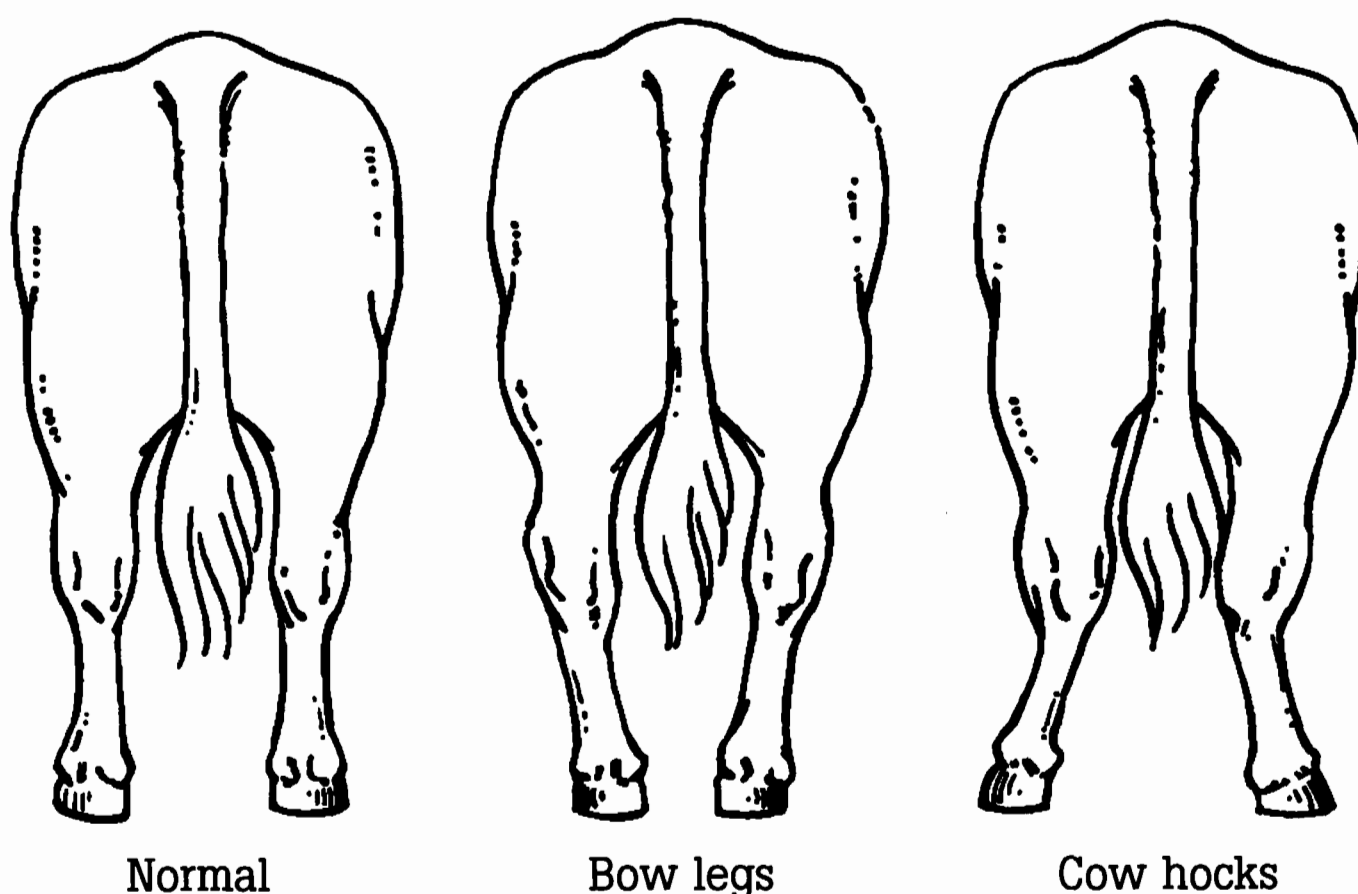
Only physically and reproductively sound bulls should be purchased. All bulls need to be thoroughly checked prior to mating or at each muster in continuously mated herds.

Physical soundness

A productive bull has a very active life and therefore he must be structurally sound. Bulls with conformation problems will break down because of the strain on their legs. Mobility and libido will also be affected by these structural faults. Common leg problems are:

- sickle hocks
- cow hocks
- bow legs
- post legs.

Hind quarter conformation problems. Structural faults passed to progeny will reduce their productive potential.



Many of these faults are heritable and all should be avoided in bulls. Structural faults passed to progeny will reduce their productive potential. Problems are also commonly experienced with hooves, for example:

- Both hooves not symmetrical in size and shape.
- Long narrow hooves with shallow heels, often associated with weak pasterns.

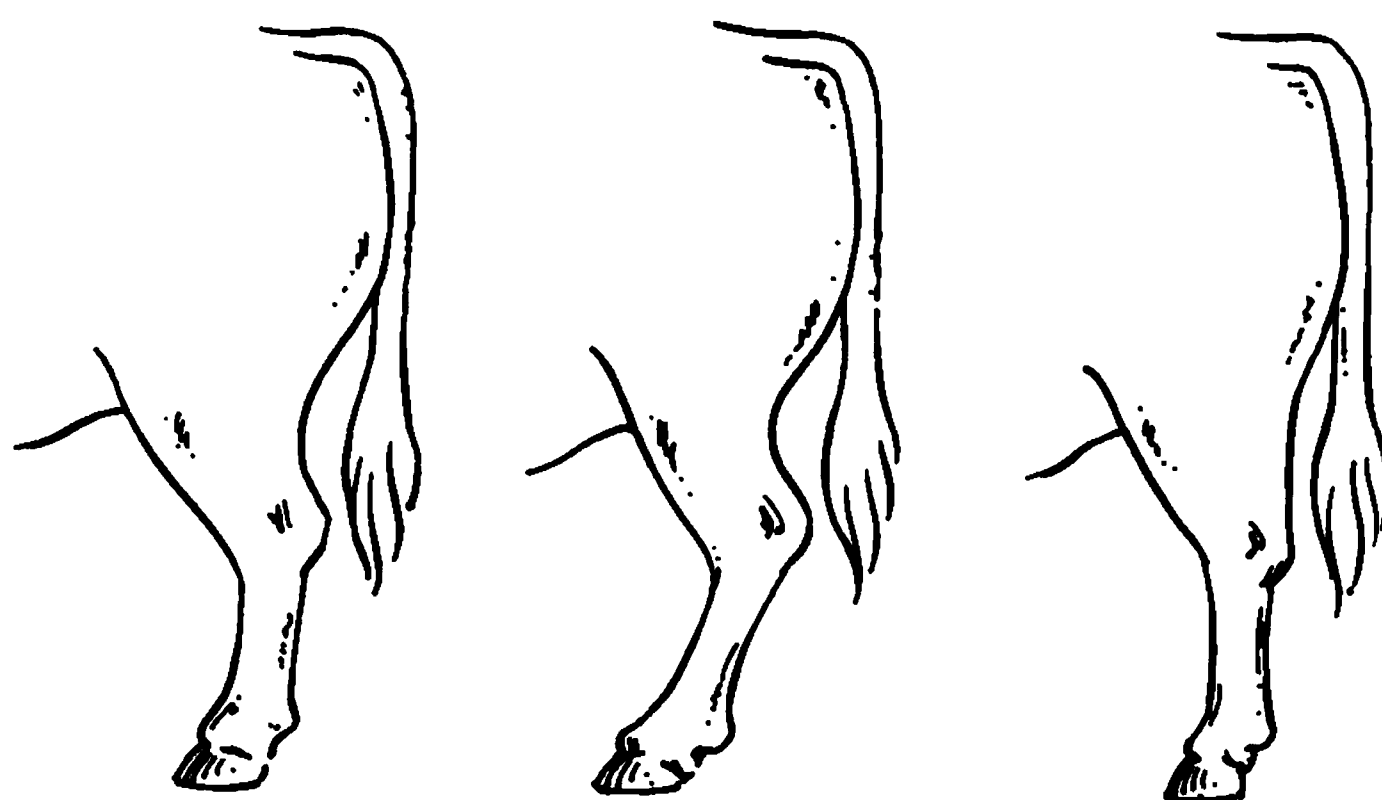
Hoof faults can also be indicative of leg problems and reduce a bull's mobility. Affected bulls should be avoided. The gait of bulls must also be checked to ensure they move freely and there is no arthritis in the legs or back. Bulls may have to be trotted to observe some problems. Commonly observed conditions in bulls include the following.

Progressive posterior paralysis. This condition is seen in bulls over six years and is characterised by a slow onset of symptoms. Typically, the condition worsens with time and is often associated with severe arthritis of the backbone.

Post legs. This heritable condition is the major cause of rear limb problems in bulls.

Stringhalt. This condition occurs primarily in *Bos indicus* bulls and is due to locking of the patella (kneecap) and associated ligaments, resulting in backward extension of the stifle joint.

Post legs and other conformation problems are heritable and should be avoided when selecting bulls for use in the herd.



Normal

Sickie hocks

Post legs

Reproductive soundness

It is estimated that 10–20% of *Bos indicus* bulls have fertility problems. This represents a major cost, and selection procedures should aim at keeping these bulls out of the herd.

Scrotum and testicles

Scrotal size is closely related to sperm production and hence a bull's potential fertility. Scrotal size is also highly heritable and appears related to some aspects of female fertility. For these reasons, it is an important criterion in bull selection.

Bulls can be examined for scrotal size at 18–24 months. Brahman bulls in northern Australia should have a minimum scrotal circumference of 28 cm at two years and 30–32 cm at three years. Testicular hypoplasia (underdevelopment) in either one or both testicles occurs in up to 15% of young bulls and is a major limitation to fertility.

Scrotal conformation and the shape and position of testicles are also important considerations. The scrotum should hang freely between the legs and perpendicular to the body. In a relaxed condition, the scrotum should have a distinct neck and enlarge towards the centre of the scrotum. The epididymis at the base of the testicle should be pronounced. When palpated the testicles should be firm like tennis balls.

Common scrotal faults are:

- Scrotum held in a tucked-up position.
- “Tied” scrotum — where the attachment of the scrotum at the rear tends to hold it more horizontal to the body.

With both these faults the testicles are held closer to the body and the bull can have difficulty regulating testicular temperature. Fertility can be impaired as a result. Twisted and uneven-height testicles are heritable and should be avoided.

Penis and prepuce

Bos indicus bulls are prone to sheath and prepuce injuries. Anatomy of the sheath and prepuce is heritable, and bulls with large loose sheaths should be avoided.

Body condition

Both overfat and poor bulls can have fertility problems. Overfat bulls, particularly those fed for shows, can deposit excess fat under the skin of the scrotum. This impairs a bull's ability to cool the testicles. Damage causing temporary or permanent infertility can result.

Bulls which lose a lot of weight over the dry season can experience a 40% reduction in testicle size. This reduces a bull's ability to produce sperm and consequently its fertility. Dry season breeder supplements will help maintain bull condition.

BREEDPLAN and the bull buyer

Rod Thompson, Geneticist, Townsville

Many studs are providing BREEDPLAN Estimated Breeding Values (EBVs) on bulls for a range of traits. The following is a description of how to use BREEDPLAN EBVs when purchasing bulls.

Assisting the bull buyer

BREEDPLAN can assist the bull buyer by providing an *aid* to other methods of selecting bulls. It will help the buyer get value for money.

Bull buyers currently take many factors into account when selecting bulls. They consider appearance, size or weight, age, the reputation of the bull seller, and probably many other factors. BREEDPLAN assists by giving the best possible estimate of the *genetic merit* of the bull.

Genetic merit

The genetic merit of a bull for a particular trait is an estimate of what genes for that trait the bull possesses and can pass on to its progeny.

When we measure the differences between animals, these reflect not only the genetic differences between the animals, but also differences in management, nutrition, health and many other factors which we group together collectively as the environment. The genetic merit of a bull represents that portion of these differences that can be attributed to genetic differences.

Measuring genetic merit

BREEDPLAN measures genetic merit by not only measuring the performance of the individual animal, but also *measuring the performance of as many of the animal's relatives as possible*.

A bull's progeny will have received half its genes from the bull. Thus, each time we measure progeny we are getting an estimate of half of the bull's genes. The same applies to other relatives, with varying proportions of the bull's genes being sampled. BREEDPLAN uses

computer software to mathematically put together all these samples of an animal's genes into a single-figure estimate of genetic merit. This estimate is called an *Estimated Breeding Value* or EBV.

Traits reported by BREEDPLAN

Currently, BREEDPLAN can provide EBVs for 5 growth traits and 2 fertility traits, as well as 2 carcass traits where these have been recorded.

Growth traits

- Birth weight
- 200-day growth
- 200-day milk
- 400-day weight
- 600-day weight

Fertility traits

- scrotal circumference
- days to calving

Carcass traits

- eye muscle area
- fat depth

EBVs are only reported for birth weight, scrotal circumference and days to calving, when these have been recorded by the bull breeder. EBVs for the other traits are estimated from the traits that are recorded even if the individual weight has not been recorded.

Breedplan measures genetic merit by measuring the performance of the individual animal, and the performance of as many of the animal's relatives as possible.



Reporting EBVs

This is best explained by looking at an example of two bulls (note that to be validly compared, the bulls must have come from the one herd in BREEDPLAN or the one breed in GROUP BREEDPLAN):

Table 6 Comparing bulls by EBVs (kg)

	Birth wt	200-day milk	200-day growth	400-day growth	600-day growth
Bull A	-1.5	+2	+8	+15	+24
Bull B	+0.9	+6	+4	+10	+17

Thus, Bull A has EBVs which are:

- 1.5 kg below herd base for birth weight
- 2 kg above herd base for 200-day milk
- 8 kg above herd base for 200-day growth
- 15 kg above herd base for 400-day growth
- 24 kg above herd base for 600-day growth.

Similar figures can be taken from the EBVs for Bull B.

Each bull passes on half its genes to its progeny. Thus, if the two bulls were mated to cows of equal genetic merit, we would expect Bull A's progeny to average 1.2 kg lighter than Bull B's progeny for birth weight. This is half the difference in EBVs between the two bulls. Similarly Bull A's progeny would average:

- 2 kg less for 200-day milk
- 2 kg heavier for 200-day growth
- 2.5 kg heavier for 400-day growth
- 3.5 kg heavier for 600-day growth.

Use of EBVs by bull buyers

There are two main ways in which bull buyers can use the EBVs.

To select bulls that will suit their particular enterprise. Considering the two bulls in the previous example, if a bull buyer was looking to buy bulls to breed vealer dams, Bull B would be the better choice, because this bull's daughters would be expected to have higher milk production than those of Bull A.

To determine the relative prices that should be paid for bulls. In the previous example, Bull A would be expected to produce progeny heavier than those of Bull B. Considering calving rates and the number of years a bull would be used, a buyer could estimate how much more could be paid for Bull A.

Comparing bulls from different herds

Bulls from different herds cannot be compared unless the herds are in GROUP BREEDPLAN. As each herd in BREEDPLAN has its own base and the EBVs are expressed relative to that herd base, it is not possible to compare bulls from different herds.

This problem has been overcome with GROUP BREEDPLAN which compares animals in the different herds relative to a common breed base (by use of reference sires to provide genetic links). This makes it possible to validly compare animals from different herds provided they have GROUP BREEDPLAN EBVs.

Accounting for environmental differences

GROUP BREEDPLAN accounts for environmental differences between herds in the same way that BREEDPLAN corrects for differences between different groups of animals within a herd. By comparing how the progeny of common or *link* sires perform in different management groups or in different herds, the computer analysis is able to validly correct for differences between management groups within herds or between herds.

Future of BREEDPLAN

The number of herds involved in BREEDPLAN is rapidly increasing. There are over 200 Queensland herds enrolled and over 1200 herds enrolled nationally. This means that there will be increasing numbers of bulls being offered for sale with EBVs available.

There are GROUP BREEDPLAN EBVs available for a number of breeds. It is expected that this number will continue to increase until virtually all major breeds are involved. Bull buyers should find that there are now many more bulls offered for sale which have EBVs. This will assist in assessing the genetic merit of the bull.

Nutritional requirements and supplementation

Rod Thompson, Geneticist, Townsville

The nutritional requirements of cattle have been accurately defined for intensive production systems. However, in extensive grazing situations it is very difficult because of paddock and seasonal variations, and the animal's ability to select different feeds.

Because of the variability in extensive situations, only broad guidelines can be given for supplementation. Managers need to experiment, record supplement intakes and, if possible, animal performance to allow finetuning of supplementation programs.

Weaner nutritional requirements and supplementation are discussed in the chapter on weaner management (see pages 8–14).

Phosphorus deficiency

Phosphorus deficiency is recognised as a major problem over much of northern Australia. Because phosphorus is essential to all body processes,

Dry season supplementation is aimed at reducing the rate and extent of weight loss, through increased survival rates and improved future productivity.



deficiency has a severe impact on animal performance. The effects of phosphorus deficiency include:

- low calving rates
- higher losses
- low weight gains.

Despite the importance of phosphorus deficiency and the obvious benefits gained from supplementation, our knowledge is rather imprecise in terms of requirements and supplement regimes. A major problem is the lack of a simple test for phosphorus status. This makes it difficult to determine accurately the likely response to and benefits of supplementation.

Phosphorus supplementation

The current recommendations are as follows.

Dry cattle. Feed when gaining weight: 5g/hd/day of P (phosphorus).

Breeders. Feed when dry cattle are gaining weight: 10g/hd/day of P.

In dry season when feeding non-protein nitrogen (NPN): 3–6g/hd/day of P.

If possible, phosphorus should be available from the first storms. This will require shelters for licks, or the use of all-weather blocks. If this is not feasible, feeding should commence as soon as the likelihood of heavy rain has passed.

Some research work has found a depression in steer performance with dry season phosphorus breeding. This is most likely due to the supplement providing an excess of phosphorus, relative to the intake of other nutrients from the pasture. So phosphorus supplements are only recommended for dry cattle when they are gaining weight.

Continuously mated herds will have some breeders at their peak phosphorus requirement all year round. Phosphorus should be fed with non-protein nitrogen supplements on deficient country in the dry season. If dry season supplements are not being fed, provide phosphorus and allow breeders to regulate their own intake. They will go off phosphorus as the dry season progresses and switch to a dry season supplement where provided.

Dry season nutrition

Dry season weight loss is one of the key factors in poor cattle growth and high losses. Native pastures in the dry season usually provide plenty of dry matter but it is low in protein (nitrogen) and energy, and hard to digest. Nutrient intakes fall because:

- lower digestibility produces lower feed intakes;
- nutrient content of the diet is lower.

Differences in weight loss and mortality rates between classes of cattle reflect their different nutrient requirements and ability to digest pasture.

Dry season supplementation

The aim of dry season supplementation is to reduce the rate and extent of weight loss so as to ensure survival and future productivity. This is distinct from energy and protein supplementation to keep cattle alive in droughts. Supplements can take the form of:

- non-protein nitrogen (NPN)
- true protein (protected protein)
- combination of NPN and true protein.

Non-protein nitrogen (NPN) supplements

Non-protein nitrogen supplements such as urea provide ammonia for rumen bacteria. Microbe populations and activity will increase, thus increasing the rate of digestion. Dry matter and nutrient intakes will be higher and weight loss reduced. The animal also receives protein from the breakdown of rumen microbes.

Urea supplied in commercial or home-made blocks and licks is the most common form of non-protein nitrogen. Sulphur must be supplied with urea for optimum microbe activity. When home-mixing or ordering custom mixes, add 10 kg sulphate of ammonia or 2.5 kg yellow sulphur per 50 kg of urea. When cattle are fully introduced to urea, aim to feed a minimum of 30 g/hd/day.

Little can be done about block intakes, and alternative supplements should be considered if intakes are low and stock are doing poorly. The palatability of loose licks can be varied with salt, Palabind or molasses.

True protein supplements

True proteins contain amino acids and have an animal or vegetable origin, for example, cottonseed meal.

True protein can also be broken down in the rumen to release ammonia, but the extent to which this happens depends on the nature of the protein. Protein which passes through the rumen undigested is called protected protein, and proteins vary in the degree of protection. For example, cottonseed meal is more protected than peanut meal.

Because they are digested and absorbed in the intestine, protected proteins can directly supply amino acids for body processes and are consequently better able to meet body requirements. Protected proteins will also supply some energy. Recommended feeding rates for protein meals are:

- .5 kg/hd/day for dry cattle
- 1 kg/hd/day for lactating/pregnant breeders.

Combination supplements

A number of blocks and licks are available which contain both NPN and true protein. Examples include Coopers Ultrapro Boost and Bayer Golden Pro CSM 50. Protein meals are easily incorporated into urea-based dry season licks. Combination supplements will supply both rumen nitrogen requirements and some of the animal's true protein requirements.

Supplement management

Important factors in supplement management are:

- (1) NPN supplements can only maintain weight or reduce the rate of loss, so feeding should commence before excessive weight loss occurs.
- (2) Cattle should be introduced to urea licks gradually to prevent cattle losses from gorging.
- (3) Do not let licks or blocks run out as bullying will result and possibly cattle losses from gorging. Ensure all animals have sufficient access to the supplement.
- (4) Lick containers require good drainage to prevent fluid accumulation.

- (5) Feed protein meals twice weekly to reduce bullying.
- (6) Record intakes so the effectiveness and cost of supplementation can be evaluated.
- (7) If possible, weigh a sample of the animals to evaluate their performance.

Supplement choice

Non-protein nitrogen (NPN) supplements are the most widely used because they reduce weight loss and mortalities in most situations, and are relatively cheap. Because NPN supplements work by stimulating the rumen and do not directly supply protein, they are not suitable for animals with high nutritional requirements such as early weaners.

True protein supplements are fed to animals with high nutritional requirements. On extensive properties they have been principally used for weaners. Cost and lack of cattle control have restricted their use with other classes of cattle. Under more intensive management, they may have a role with target groups such as heifers and first calf cows.

Combination supplements can improve the performance of older weaners, particularly in the latter part of the dry season. They are also useful for breeders in poor condition or on poor feed.

After considering nutritional requirements, the choice of supplement should be based on the following considerations.

Cost. The important consideration is the cost per head to feed a set amount of phosphorus or protein. Because of this, high phosphorus or urea products are generally the cheapest.

Palatability. Supplements must be readily eaten or intakes will be too low. Intake can be controlled more easily with licks than blocks.

Convenience. This is an important consideration on large properties. Although blocks are more expensive, they do offer convenience.

Local experience. Supplement intake and animal response can vary markedly between paddocks and properties. Therefore, local knowledge is invaluable in choosing supplements.



Supplements should be used to maximise individual animal performance in times of nutritional stress.

Supplements and land care

Supplements produce major increases in dry matter intake. Studies have recorded a 40–70% increase in the intake of low-quality roughage by cattle fed a urea/sulphur supplement. The increased browsing by cattle on supplements is well recognised. Increased intake is equivalent to increasing stocking rates, so stock numbers may have to be adjusted to avoid overutilising pastures.

Supplements should be used to maximise individual animal performance, not maintain excessive numbers. Maintaining ground cover and desirable species is essential for pasture productivity, stability and sustainability.

Cattle pregnancy diagnosis scheme

Robert Hedlefs, Regional Veterinary Manager, Townsville

The Australian Veterinary Association, through its special interest group the Australian Association of Cattle Veterinarians, manages the National Cattle Pregnancy Diagnosis Scheme. It is the aim of the scheme to provide both buyers and sellers of cattle with a reliable and accurate method of identifying pregnant and non-pregnant cattle presented for sale.

Under the scheme a veterinarian examines the cattle prior to sale and establishes the pregnancy status of each animal. Cattle are then individually identified with a wrap-around tail tag, colour-coded for each pregnancy category. Each tail tag bears a number identifying the veterinarian who examined the animal, an individual number for each cow, and an indication of the pregnancy category. A Certificate of Testing, signed by the examining veterinarian and listing the details of all cattle examined, is also provided.

Pregnancy categories

Three pregnancy categories are available throughout Australia:

- (1) *Not detectably pregnant* (NDP). There may be some cattle in this category that will be less than six weeks pregnant, a stage when pregnancy is difficult to confirm by manual palpation.
- (2) *Pregnant less than four months.*
- (3) *Pregnant more than four months.*

There will be an overlap between the two “pregnant” groups of about two weeks either way.

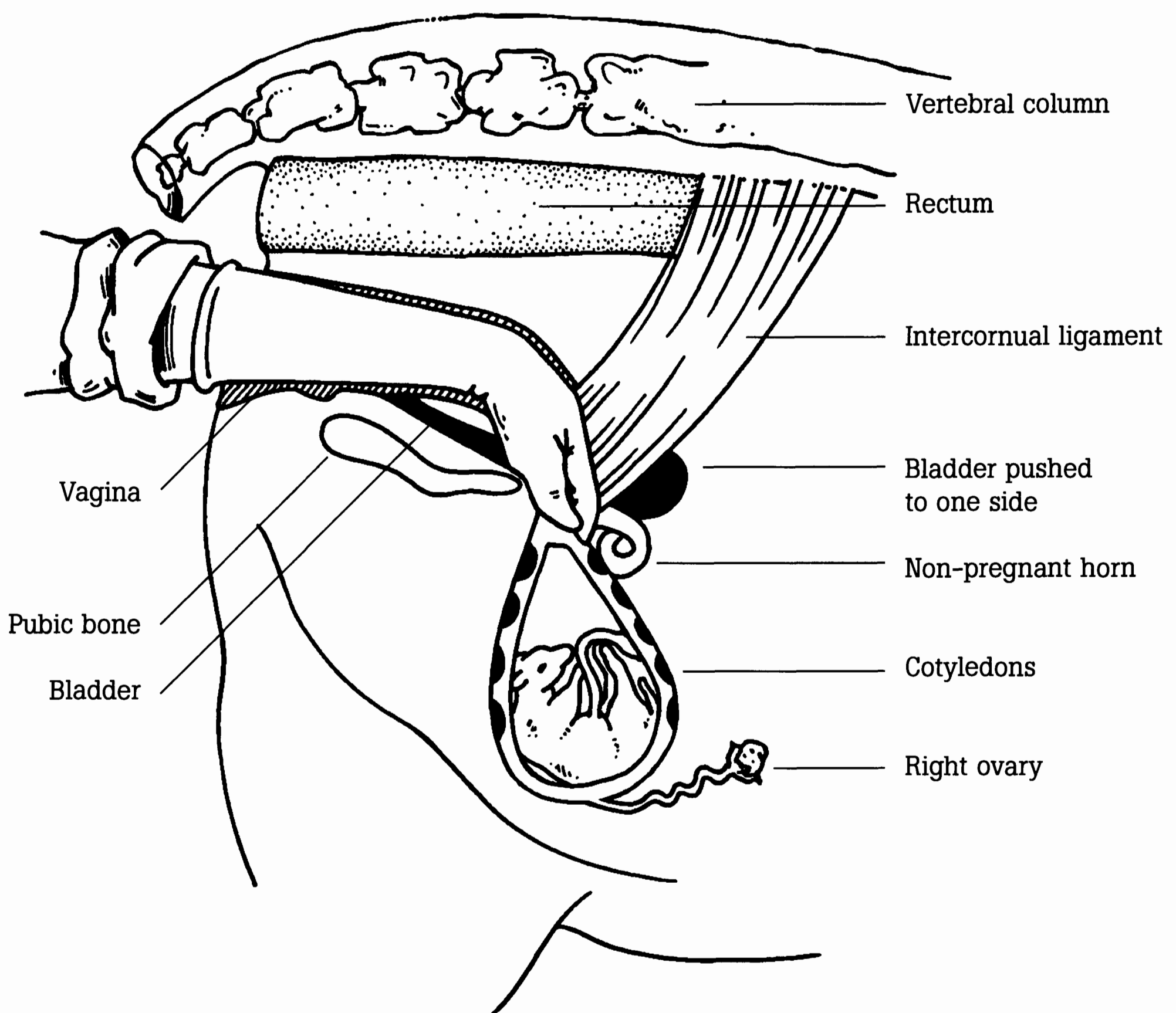
Major advantages

There are obviously major advantages from such a scheme:

- Store buyers do not have the losses associated with varying proportions of non-pregnant cows in a draft.

- Sellers attract a premium for their cows.
- Higher yields attract meatworks buyers to known empty cows.
- Reproductive losses due to slaughter of cows in advanced pregnancy are minimised.

It is essential that adequate facilities are provided to restrain cattle for pregnancy diagnosis. This is essential if accuracy is to be maintained and injury to the veterinarian avoided. Ensure that the race and crush to be used are strongly built. If in doubt about the facilities, check with your veterinarian.



Accurate identification of pregnant and non-pregnant cattle presented for sale benefits both buyers and sellers of cattle.

Transportation, handling and welfare of livestock

John Lapworth, Senior Livestock Adviser, Brisbane

Livestock transport responsibilities

Livestock transport can be split into two separate management responsibilities:

- pre-transport management
- in-transit management.

In each of these management areas, different people are given the responsibility to present the stock in top condition with as little stress as possible, so that the owner of the animals can get the best money for them at the point of sale.

Pre-transport management begins when you propose to send cattle to market.

Animal welfare

Animal welfare is an important issue that everyone must be aware of. The Animal Welfare Codes of Practice clearly state that the person *in charge of the livestock* is the person who has the responsibility for those animals. The owner/manager is responsible for the welfare of the animals until they enter the truck. The driver assumes responsibility at loading and they are in his care until they are unloaded.

Trucking company

Choose your transporter carefully. You must be satisfied that the operators have well-maintained truck and trailer/crate units, and that they are reliable and will arrive to load at the agreed time and place.

Livestock manager

The person in charge of the livestock must ensure that the cattle to be

moved are fit to travel, and have been fed, watered and then fasted. Cattle are normally fasted overnight before loading early in the morning. It is also the property manager’s job to ensure the stock are ready to load at the agreed time and place.

Horns

Horns should be removed at branding or weaning. The meat processors do not pay extra for horns but they do deduct money when they remove the bruising caused by horns. In horny cattle, bruising may average in excess of 5 kg per head and \$2.70 per kg dressed weight. This amounts to a loss of at least \$13.50 per head. Cattle destined for the live export trade should also be dehorned. Dehorning is a requirement of most importing countries.

Stock densities

Before loading, the cattle should be inspected and a suitable density agreed upon between the truck driver and the stock manager. It is wise to trust the judgement of experienced drivers. Their knowledge of road conditions, the expected time in transit, and the condition of your cattle are the basis for arriving at a decision. The following table is a suggested stocking density for various classes/weights of cattle.

Table 7 Suggested loading densities for road transport of cattle

Mean liveweight (kg) of cattle	Floor area (m ² /head)	No. of head per 12.5 m deck
250	0.77	38
300	0.86	34
350	0.98	30
400	1.05	28
450	1.13	26
500	1.23	24
550	1.34	22
600	1.47	20
650	1.63	18



Yarding cattle prior to loading on trucks.

When horned cattle are loaded, it is normally necessary to reduce the density by at least one or two animals per deck. It should also be noted that jamming in the extra few to reduce the transport cost per head mostly does not work. It normally results in excessive bruising, and sometimes deaths in transit or whole-carcase condemnation at the abattoir.

Travelling times and spelling

Cattle can be transported for up to 40 hours if that will complete the journey. After this period, they should be fed and watered and given a spell of 12–24 hours before being transported further. The cattle should be unloaded into spelling yards large enough for them to exercise and lay down and rest.

Jiggers, dogs and other implements

Cattle can be encouraged to move by using all sorts of devices. The most commonly used implements are electric prods (jiggers), flappers,

polypipe and small sticks or branches. Often it does not matter what is used but rather how it is used. It is pointless beating an animal at the back of the mob when the one up front is causing the problem. *The use of heavy pieces of wood, large sticks or steel pipe must be banned!*

Dogs are often very useful when mustering in scrubby paddocks, but can cause disasters in yards. When working cattle in yards, it is best to tie the dogs up as they quickly teach the cattle to kick when they see a slight movement near them. It may be you that they kick.

Ramps

When loading large numbers of cattle, double deck loading ramps should be used. They save a lot of time and significantly reduce the levels of stress and bruising. Advisory leaflets covering transport strategies, stock crate design, and loading ramps are available from your local Department of Primary Industries office.

Conclusion

Most cattle producers are proud of the animals they produce and enjoy advertising their successes. To ensure that you can continue with this practice, it is necessary to *stop bad handling* and *avoid overloading*. Unless this happens, the beef industry will continue to see *unacceptable levels of dark cutting meat* and *bruising*, with a continuing small percentage of *animal deaths* and *carcase condemnations*.

This results in reduced profitability and puts in question the long-term survival of producer and processor.

Dehorning calves

Felicity Hill, Beef Adviser, Cloncurry

Rod Thompson, Geneticist, Townsville

Why dehorn cattle?

Bruising costs the Queensland beef industry millions of dollars every year. Research by the Department of Primary Industries has shown that the single major cause of bruising is the presence of horns. Reducing bruising and hide damage is a component of quality assurance systems such as CATTLE CARE.

It is highly desirable that cattle destined for live export are dehorned or polled. This is a requirement of the majority of importers. Australian Quarantine Inspection Service (AQIS) veterinarians certifying shipments will pull out horned cattle if it is likely that these animals will cause injury or stress to other cattle. Compared with hornless stock, horned cattle:

- are less saleable
- can cause injury to other cattle, especially in yards and when in transport
- can damage hides
- are harder to handle in yards and crushes
- are potentially more hazardous to stockmen.

Various methods are available for dehorning. The most effective method depends on the age of the animal and the horn size.

Hygiene

Good hygiene is important to prevent losses due to infection. The risk of infection is increased in dusty or wet conditions, and when flies are active. It is advisable to place the dehorning instrument in a bucket of antiseptic solution after dehorning each animal. Before commencing dehorning, sharpen all instruments.



Bruising caused by horns costs the beef industry millions of dollars every year.

Treatment after dehorning

The application of wound dressing (dusting) powders is often sufficient treatment. Fly strike is most prevalent in hot weather. Extra precautions can be taken by spraying with an insecticide containing buffalo fly control agents before dehorning. It is also preferable to let the cattle out of the yards as soon as possible after dehorning.

Age

The younger the animal at the time of dehorning the easier the job. With their smaller size, they are easier to handle and to dehorn. Additionally, the younger the animal the less chance of fly strike, and the less stress, particularly if it is young enough to go back onto the cow. It is, however, not advisable to dehorn very small calves.

Calves missed at branding can be dehorned at weaning. Removing horns from yearlings and adults is time consuming, painful for the animal, and increases the chances of a growth setback. Unfortunately, there always seem to be one or two that get missed.

Method

The method of dehorning should be matched to the size of the horn/age of the animal for optimum effectiveness. The level of skill of the operator and personal preference for a particular method will also be a consideration. There is no one method for a particular animal age or horn size.

The dehorning knife

The dehorning knife has a curved blade similar to a shoeing knife without a hook on the end. The knife is available to both right-handed and left-handed users and may be held with the blade pointing either from the inside or the outside of the hand, depending on the user's preference and feel for greater control. The dehorning knife must be kept extremely sharp.

Without a dehorning knife it is difficult to satisfactorily dehorn young calves without leaving a big hole in their head. The dehorning knife is ideally suited to young calves that still have a loose, unattached horn

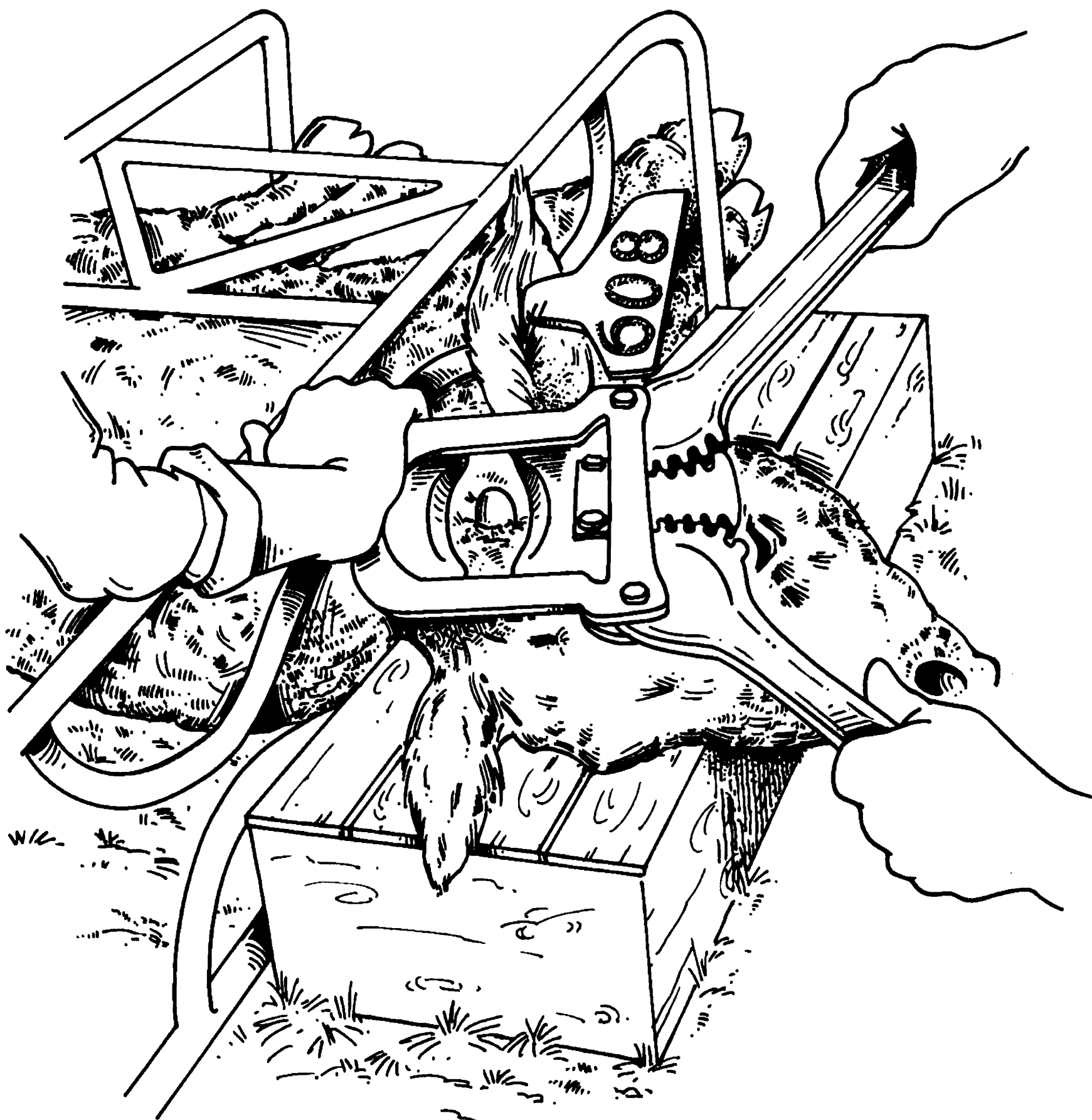
bud. Once the bud has grown solid to the skull, a small scoop dehorner may be a better choice.

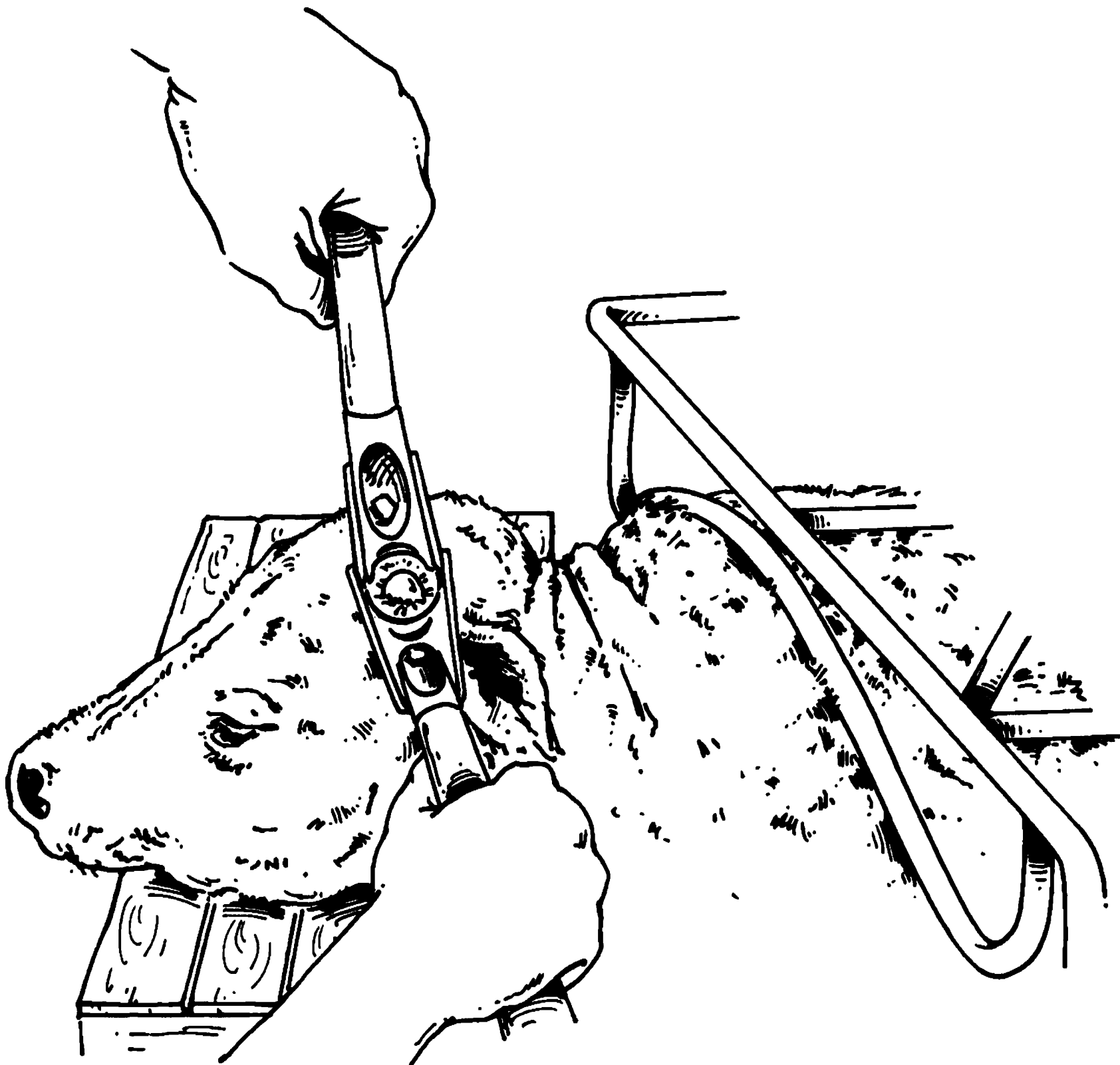
To dehorn the calf effectively, a complete ring of hair around the horn bud must be removed. Failure to do so will result in a “snaily horn” or scur developing. The width of the ring of skin will probably depend on the size of the horn but as a general rule should be no less than 6 mm. The dehorning knife will give excellent results with practice. It is advisable not to dehorn small calves if the horn cannot be easily seen or felt.

Dehorning irons

The use of dehorning irons does not result in an open, raw wound. Dehorning irons are made like number “O” branding irons. They can

Cup dehorners can be used on calves up to 5–6 months.





Scoop dehorners are often used on cattle up to weaner age.

come in different sizes but usually have a diameter of 50 mm. The hot iron is placed over the horn bud and the surrounding tissue and twisted a few times. This technique ensures that the blood supply will be seared off and the horn bud area will die and drop off. Success of the operation will depend on the heat of the iron and the length of time the iron is applied.

Cup dehorners

Calves that are too big to dehorn with a knife or hot iron can be dehorned with cup dehorners which will handle cattle up to about 18 months of age. Cup dehorners operate like a pair of shears and may need a second person to press down on the working end of the dehorner to prevent them riding up the horn. Again, it is necessary to take a complete ring of skin around the horn base.

Scoop dehorner

Scoop dehorner are used by passing them vertically down over the horn and pushing the handles outward, thereby scooping out the horn. As with other methods the head of the animal must be well restrained.

Scoop dehorner can leave a deep hole if used on too small an animal, but are useful for weaners and older cattle. Several sizes of scoop dehorner are available.

Important points to remember

- The younger the animal at the time of dehorning the easier the job and the less chance of a setback.
- Match the method to the size of the horn.
- Keep the head of the animal well restrained.
- Practise good hygiene.
- Tipping large horns does not reduce bruising.

Improving hide values

Joe Gibson, Gibson Management

Natural resources are valuable, and Queensland cattle hides are no exception. Virtually every beast reared in Queensland has a hide which will be converted into leather. The high cost of finished leather goods is an indication of the intrinsic value of this important raw material. In fact, Australia is the second largest exporter of cattle hides in the world. A container load of hides can be worth more than a container of meat!

Improving our hides

Hide damage results in enormous losses. Yet it would be possible to increase the value of Queensland hides simply by improved branding. The position of a brand scar has a great influence on the cutting value of the leather produced from hides, and one rib brand can drastically reduce the hide value.

It is suggested that hide damage due to branding be minimised by confining any body brands to one area at the edge of the hide, and by encouraging the use of symbol brands and their placement on the cheek. Some Queensland graziers have already chosen to use this system which complies with the *Brands Act 1915* (Queensland).

Some Queensland graziers are using the system where they place the first brand high on the rump and subsequent brands beneath it. Current legislation allows for the first brander to use a symbol brand on the cheek of the animal rather than branding on the body. The symbol brand would more readily fit the rump of very young calves than a three-piece brand.

Recommendations

- (1) Adopt branding positions which confine body brands to one area at the edge of the hide.
- (2) Discourage rib branding.
- (3) Encourage the use of symbol brands.

Table 8 Common sources of hide damage

On-farm	
Parasitic	Demodectic mange Tick Buffalo fly
Branding	Too large Badly placed
Scratches	Barbed wire Horn marks Gates and yards Vegetation
Other	Shotgun wounds/bullet wounds Warts
Off-farm	Pre-slaughter
Scratches	Yards Rail and road trucks Horn marks
Off-farm	Post-slaughter
Flay	Cuts Scores Puller stretch
Grain damage	Bacterial attack Hot water damage Sun damage
Scratches	Open scratches Knife cuts

Rearing poddy calves

Alan Laing, District Adviser, Ayr

The aim of calf feeding is to maintain survival and produce a well-grown, healthy calf. Poddy calves are just another group of early weaners.

If they are less than 24 hours old and have not sucked, they should be given colostrum from a freshly calved cow. It may be advisable to keep frozen colostrum on hand from a freshly calved cow for baby orphans.

The colostrum is required to provide the calf with its first antibodies which come in the milk. In the cases where colostrum is not available, an artificial colostrum can be fed (see ingredients below).

Artificial colostrum

1 egg beaten in 0.3 litre water

2.5 ml castor oil

0.6 litre whole milk

(Fed three times a day for up to three days)

An average calf will consume up to two litres of milk twice a day. This milk may be either excess milk from a milker or a milk replacer mix.

Orphan calves no longer have to be reared on milk. They can be reared successfully on high-protein calf meals. This calf meal (see Table 9) should be offered from the start. Once-a-day feeding of milk will encourage the calves to eat meal.

Calves should not have any access to pasture. Once calves are eating 1 kg per day of meal, feeding of milk should cease. The smaller a calf is, the higher are its nutritional requirements, particularly protein.

Dehydration

Where you have to start feeding an older orphaned calf, the first thing you need to assess is whether the calf is dehydrated or not. If it is, it will have a “tucked up” appearance.

In this case you need to feed an electrolyte first, to reduce the

Table 9 Feeding orphan calves

Stage	Recommended feeding	Possible substitute
Birth–50 kg (approx. 4 weeks)	RESTRICT GRAZING Free access at all times to at least 20% protein calf meal including Rumensin.	50% cottonseed meal 50% grain
50–70 kg (approx. 4–8 weeks)	RESTRICT GRAZING Free access at all times to at least 18% protein calf meal including Rumensin. Minimum 1.0 kg/day.	30% cottonseed meal 70% grain
70–100 kg (approx. 8–12 weeks)	RESTRICT GRAZING Free access at all times to: 18% protein calf meal, <i>or</i> 16% protein calf meal or pellets including Rumensin. Minimum 1.5–2.0 kg/day.	20% cottonseed meal 80% grain
100–150 kg (approx. 3–5 months)	GRAZING IN A SMALL Paddock plus: 0.5 kg protein meal/day, <i>or</i> 1.5–2.0 kg/day 16% protein pellets, <i>or</i> 1.0–2.0 kg/day MUP, available at all times.	} fed 2–3 } times a week
MUP = Molasses + 3% urea + 8–15% protein meal + Rumensin Homemix (1.0 kg/tonne molasses)		

dehydration. There are several commercial electrolyte products available and it is a good idea to keep some on hand. Where these are not available, an emergency electrolyte can be used (see ingredients below).

Emergency electrolyte

- 1 teaspoon salt
- ½ teaspoon baking soda
- ½ cup glucose
- 1.2 litres of water



Calves should be put in a small paddock and checked regularly each day.

Recommendations for management of orphans

- (1) It is important that changes to the diet be made gradually to avoid stomach upsets.
- (2) It is important to keep a clean water supply for the calves at all times.
- (3) Coccidiosis (black scours) may be a problem but can be prevented by avoiding overcrowding, isolating calves from older stock, and giving good-quality feed to the calves at all times.
- (4) Where meals are fed to older calves, allow 15–20 cm trough space per calf.
- (5) Ticks and lice can quickly affect young calves, especially those which are not fed properly. Regularly inspect the calves and treat accordingly.
- (6) Be prepared to treat calves for worms.
- (7) Do not put small weaners in a large paddock. Put them in a small paddock and check them often.
- (8) The prepared calf meals (registered or custom-mixed) are better balanced nutritionally, and give better performance than the home-mixed protein meal plus grain.

“Do it right” with animal health products

Allan Childs, District Inspector of Stock, Mackay

“Do it right” is the theme selected for a major national project to achieve improved, safe and responsible use of veterinary drugs and chemicals by primary producers and the general community.

The project will provide information about drugs and chemicals relevant to management, markets and the long-term use of agricultural and natural resources. Technical self-help kits are sponsored by major veterinary drug and chemical companies. Quality assurance is becoming a global issue and is synonymous with safe and responsible management in all areas of the food industry.

Causes of residues

Most residues related to tick control chemicals are the result of one or more of the following:

- dipping in overstrength chemicals
- dipping too close to slaughter
- repeated treatments at short intervals.

Under normal circumstances residues from tick control chemicals disappear from animals within a few days unless the initial dose is extra-high or they are reinforced by more treatments at short intervals.

Preventing problems

- Analyse the dip contents regularly.
- Dip at the recommended strength.
- Cattle should not be dipped before slaughter (see Table 10, pages 56–57).
- Calibration of automatic syringes or drench guns should be regularly checked for accuracy, using a measuring cylinder.

Chemical residues in livestock

Barry Torenbeek, Regional Inspector of Stock, Townsville

Main sources of contamination

The main sources of contamination in cattle are the following:

- organochlorine (OC) treated yards or building foundation
- crops treated with OCs
- small crop waste
- cotton trash
- chemical treatment for control of ticks and buffalo fly.

When drought conditions prevail, many small crops (or crops not normally used for fodder) are utilised by graziers desperate for protein supplements. In most cases this is beneficial but in some it can cause chemical residue problems.

With the total banning of organochlorine chemicals, for example, dieldrin and DDT, the risk to the livestock industry of OC contamination has been decreased. However, where cattle are agisted on properties previously used for small crops, there is always a possibility that residue contamination may occur, particularly OCs because of their persistence in the environment.

It is in the grazier's interest, therefore, that before agisting cattle on particular areas the history of any cropping or possible chemical residue contamination be assessed.

Crops fed to cattle can contain contaminants. In recent times, the pesticide Chlorfluazuron (CFZ) used widely in the cotton industry has been responsible for residue problems in export beef. This has led to a total ban on feeding cotton trash to stock.

The above problem has led to intensive quarantine and tissue sampling for identification of contaminated stock. The Australian Quarantine Inspection Service (AQIS) has demanded all meatworks test a percentage

of all stock slaughtered. This has led to vendor declarations being required in most cases before cattle will be accepted for slaughter.

Chemical treatment of stock

Treatment of stock by the grazer for tick control, buffalo fly control and lice control involves the use of chemicals which, if incorrectly used, may result in contamination above the maximum residue limit (MRL). All chemicals used in the livestock industry are required to be registered by the National Registration Authority for Agricultural and Veterinary Chemicals.

Particular stock treatment activities

The type of chemical, its use, and the concentration required for a particular activity (for example, plunge dipping for ticks) are presented on the label on each container. The necessary requirements for prevention of injury to the operator are also listed on the label and should be followed to the letter.

The treatment of stock for pest management with chemicals may result in a withholding period (WHP) before slaughter for food animals. Some of these and their MRL (maximum residue limit) are listed in Table 10.

Correct compliance with the use of chemicals aims to achieve the following results:

- economic viability
- sustainability
- environmental protection
- clean high-quality meat products.

Table 10 MRL levels and other requirements

Brand name	Active	WHP (days)	Aust MRL	USA MRL	ESI (days)
Amitik Taktic WP & EC Ditik WP 500 Nu-tik EC & WP SPR Amitraz	Amitraz	nil	0.01 meat 0.5 offal	0.05 meat 0.3 meat by-products	nil
Bayticol Pour-On	Flumethrin	nil	0.05	0*	56
Bayticol Dip and Spray	Flumethrin	nil	0.05	0*	nil
Sumifly	Fenvalerate	nil	0.2 fat .02 offal	1.5	nil
Supona Buffalofly	Chlorfenvin- phos	nil	0.2 fat .02 offal	0.2	nil
Cypafly, Swot	Cypermethrin	3	0.5 fat .05 offal	0.05	WHP only ^a
Barricade S Blockade S	Cypermethrin and Chlorfen- vinphos	8 ^a Stirrers 14 days	0.5 fat .05 offal 0.2	0.05 0.2	21
Arrest	Deltamethrin	nil	0.5 fat 0.5 offal	0*	21
Tixaflly	Deltamethrin	nil	0.5 fat 0.2 offal	0*	21
	Ethion		2.5 fat	2.5	
Coopaflly	Deltamethrin	nil	0.5 fat 0.1 offal	0*	30
Spike Eartag Y Tex Optimiser Eartags	Diazinon	nil	0.7	0.7	nil
Diazinon 200) Buff Fly Di) Nucidol)	(back rubber use)	Diazinon	3	0.7	0.7
Ivomec Pour-on	Ivermectin	42	0.01	0.05	42
Fican Gold Dust) Cattle Dust)	Bendicarb	nil	0.1	0*	nil

(continued)

Brand name	Active	WHP (days)	Aust MRL	USA MRL	ESI (days)
Cydectin Pour-on	Moxidectin	14	2.0 fat .5 offal	0*	28 single 40 multiple
Grenade Cattle Dip Buffalo Fly Spray	Cyhalothrin	nil	0.5 fat .02 offal	0.01	Not recom- mended
Bayofly	Cyfluthrin	nil	0.5 fat 0.01 offal	0.05	21
Diazinon 200 (backspray) Buff Fly Di (backspray) Nucidol (backspray)	Diazinon	3	0.7	0.7	3
Acatak	Fluazuron	42	7.0 fat .5 offal	0*	Controls apply

^a Single treatment
 * No limit set (nil residues)

Table 11 Organochlorines

Chemical	MRL	Half life in soil*	Half life in fat*
Aldrin (breakdown to dieldrin in fat)	0.2	6 years	6–8 weeks (as dieldrin)
BHC	0.3	2–3 years	6–9 weeks
Chlordane	0.3	5–12 years	Oxychlordane Insufficient data
DDT	5.0	3–10 years	4–12 weeks
Dieldrin	0.2	1–7 years	6–12 weeks
Endrin	0.02	6 years	No residue formed in fat
HCB	1.0	15 years	10–13 weeks
Heptachlor	0.2	7–12 years	6–12 weeks
Lindane (Gamma isomer of BHC)	2.0	5 years	7–10 days
Methoxychlor	3.0	–	3–5 weeks

* Half life = Period of time taken for chemical concentration to reduce by half.

Tick control in North Queensland

Glen Sibson, District Inspector of Stock, South Johnstone

Planned dipping remains the most efficient method of tick control for cattle susceptible to ticks. European breeds and crossbreeds with less than 5/8 Zebu blood are very prone to tick infestation.

Most cattlemen control ticks by conventional dipping. The emphasis of this method is placed solely on killing the ticks that are attached to cattle at the time of dipping. Little thought is paid to keeping the pasture relatively free of seed ticks.

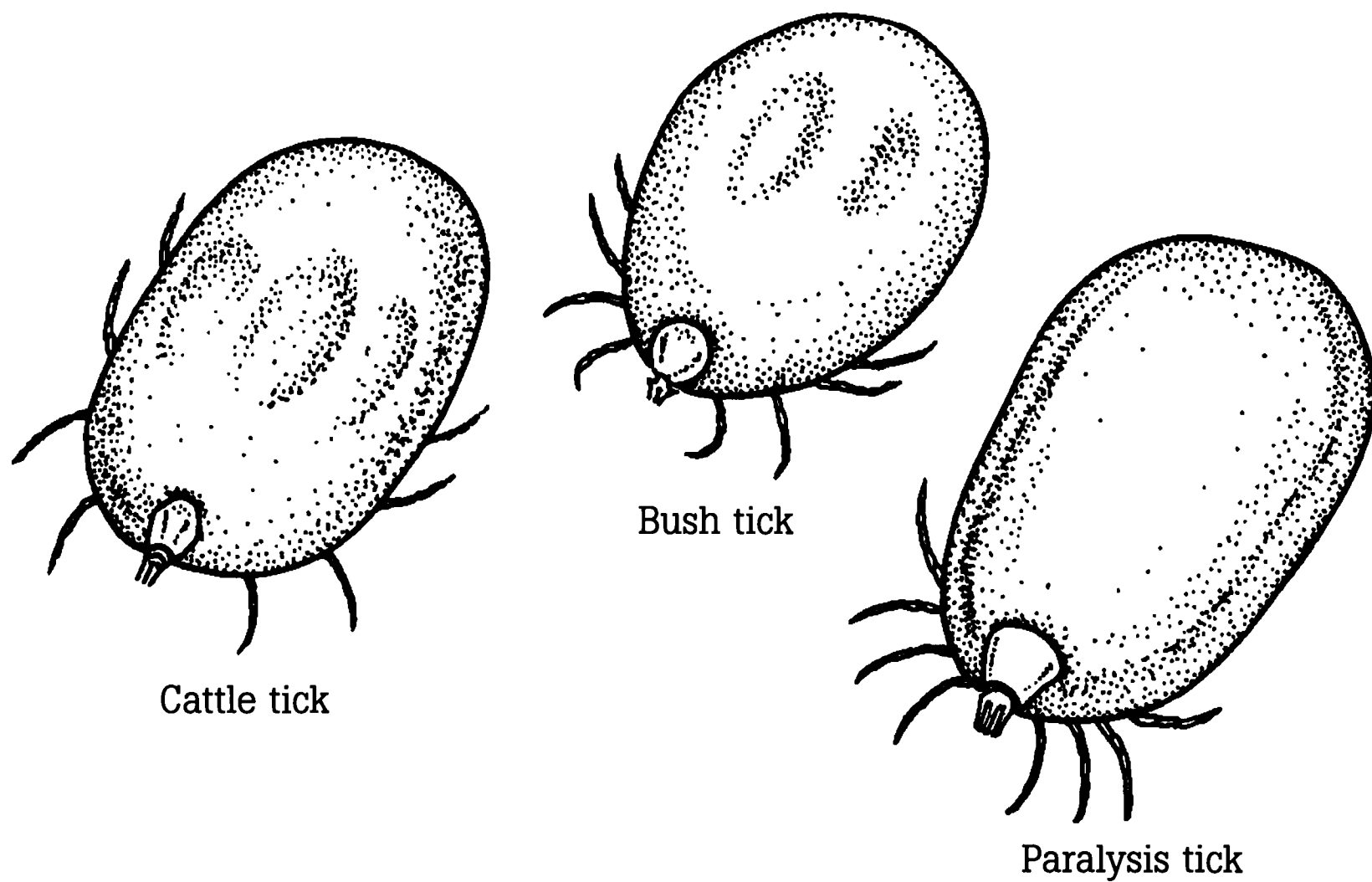
In comparison to conventional dipping, planned dipping can reduce the tick burden by another 80%. It also reduces cost by decreasing the number of treatments and therefore the use of labour and chemical.

Planned dipping is based on employing tickicides efficiently in a control program that exploits knowledge of the tick's life cycle. It is aimed at the parasitic stage of the tick, but has its main effect on the non-parasitic stage in that it stops reproduction. In northern Queensland, tick reproduction may cease during summer because of hot, dry conditions (dry tropics) or excessive moisture during the wet season (wet tropics).

The useful life of a tickicide is reduced each time cattle are treated. When it loses its effectiveness, it may be replaced by another which, in all probability, will be more expensive. It is therefore imperative that maximum control is obtained with as few treatments as possible. This is a significant cost factor which is largely ignored because it is too difficult to measure.

Planned dipping

Planned dipping is particularly effective if it is timed to follow the summer halt on tick reproduction. The program consists of 4–6 dip treatments at 21-day intervals, commencing in March. Where Bayticol Pour-On is used, 3–4 treatments are required at 35-day intervals.



Common tick species which affect cattle.

These treatments break the life cycle and prevent engorged females from dropping off to lay eggs, thus reinfesting the pasture.

It has been found that ticks take a long time to build up numbers again after the completion of this strategic program. Sometimes one or two treatments may be required in spring in an odd paddock where tick control is difficult.

Atherton Tablelands and wet tropics

Due to different climates experienced in these two areas, the planned dipping program mentioned previously may have to be adjusted. On the Atherton Tablelands, with tick-susceptible cattle, planned dipping should commence in November. In the wet tropics, a planned dipping program will require more than six dippings for tick-susceptible cattle. Close monitoring of tick levels is required for all cattle on the wet coast to ensure control.

Tropical breeds

This program does not apply to high-grade Zebu or Tropical breeds. These cattle are tick resistant, and may only need to be treated during the autumn months when tick numbers increase dramatically.

Successful programs

Successful programs require that:

- (1) ticks are killed by the chemical in use;
- (2) dipping facilities thoroughly wet cattle and are correctly managed;
- (3) all cattle are treated including calves;
- (4) treatment intervals do not exceed 21 days for dips and sprays, or 35 days for Bayticol Pour-On;
- (5) there is good fencing to prevent treated cattle mixing with other stock that have not been dipped and may be ticky.

Testing resistance

Fully engorged ticks can be tested for resistance by submitting them for testing to the local stock inspector. Property owners should be careful they do not introduce resistant ticks which may be carried on cattle purchased from other areas. Treat and inspect all such stock before releasing into paddocks.

Cattle dip management

Glen Sibson, District Inspector of Stock, South Johnstone

Cattle producers in northern Australia outlay thousands of dollars each year on the maintenance and running of station dips. To ensure these dips are used efficiently, economically and safely, correct operating and management procedures must be adopted.

Concentration

When cattle are dipped the aim of the operation is to kill ticks — no more, no less. The concentration of acaricide (tick killer) is very important. If the concentration is low, ticks will survive and the labour of mustering and dipping is wasted. Some ticks may even begin to acquire

Correct dip management is essential for tick control. Detailed records and regular fluid analysis are essential to maintain dip fluid at the recommended chemical concentrations.



resistance, making future generations harder to control. If the dip concentration is too high, expensive chemical is wasted and problems from pesticide residues may arise.

The reputation overseas of Australia's beef industry has been tarnished in recent years by chemical residues. Part of the problem has been traced to overstrength cattle dips which can also result in toxicity hazards.

Factors affecting concentration

Several factors affect cattle dip concentration: the accuracy with which the dip was charged in the first place, accuracy in replenishing it, and how accurately you take samples for testing. Other factors affecting the chemical concentration are evaporation, flooding, stripping of the chemicals from the dip, and pollution.

When charging or replenishing a dip, great care should be taken to maintain accuracy. A water meter in the line between the tank and dip gives the greatest accuracy. You can also use graduations, permanently marked on the concrete wall. If there are no graduations on the wall, a dipstick should be used to determine the capacity.

When using a dipstick, measurements should always be taken in the same place. To maintain cattle dip concentration within acceptable limits, you need to be able to read changes of level in 200-litre steps.

Stirring

All chemicals should be pre-mixed before adding to dip. After adding the chemical, use a shovel or a bucket on a rope to stir the chemical. Then use 20–30 head of cattle to agitate the dip thoroughly. Before you dip any other cattle, run the stirrers through again immediately. They could have highly concentrated chemical clinging to their hair. This will minimise the possibility of toxic effects, as well as returning the excess chemical to where it belongs, in the dip.

Evaporation

In the north, evaporation is an important factor affecting cattle dip concentration. Evaporation caused by direct sun or the wind can remove

up to 700 litres of water in a week, leaving too high a concentration of chemical. Fortunately, these effects can be minimised quite easily by providing a roof to shade the dips while sheets of corrugated iron at each end will stop the wind tunnelling through the dip. Any evaporation losses that still occur can be redressed by adding more water, not more chemical.

Flooding

Flooding has the opposite effect to evaporation, in that heavy rain can dilute the dip, thus weakening the concentration. Flooding can be prevented by a roof and by checking that the plug or cap is on the return pipe after dipping. Good drains around the jump-in end and walk-out end will prevent run-off from entering the dip.

Stripping

“Stripping” refers to the removal of chemical from the dip — that is, *dilution* of the dip. Chemicals used for tick control do not dissolve in water. They hang suspended, and tend to stick to foreign bodies such as hair, dung and dirt. When this material is carried out of the dip, the chemicals are stripped out with it, weakening the mixture. Stripping is made worse by excess pollution, so the cleaner you keep your dip and its surrounds, the less stripping will occur.

Pollution

Pollution of a dip can be reduced in a number of ways.

- A mesh grid at the entry helps remove mud, dirt and dung from hooves.
- A raised lip near the jumping-off point forces stock to raise their feet, preventing rubbish being dragged into the dip.

Dip sampling

One aspect of dip management which requires great accuracy is sampling. Unless samples are collected and packaged properly, the analysis will be inaccurate. Subsequent adjustments that you make to the dip will also be inaccurate. The correct technique is to take the sample

one metre out and one metre deep at the jump-in end, as the last animal is still swimming through. By taking a deep sample, hair and other rubbish that may be floating on the surface will not be collected.

The bottle used to collect the sample should be the one sent to the laboratory. Changing containers could contaminate the sample or give a faulty result. The sample should be carefully labelled with the owner's name and address, location of vat, acaricide in use, capacity of vat, and volume of the fluid at the time of sampling. At the start of each season it is most important to obtain a sample before the dipping program begins.

Record keeping

The successful management of the dip depends on keeping detailed records. This enables the chemical concentration to be maintained at the recommended level. The dip volume should be recorded before dipping, the amount of water and chemical should then be added, and the dip volume measured after dipping. Good dip management all adds up to safe, effective tick control, healthy stock and increased profits.

Managing Amitraz cattle dips

Charging and maintaining an Amitraz dip involves a few simple steps.

- (1) When charging, add one (1) tin of chemical and one (1) 10-kg bag of lime for every 1000 litres of water in the dip. Run at least 30 cattle through to stir the wash and then return those cattle to be redipped.
- (2) For topping up during a dipping operation: each time the water level falls by 700 litres (which can be measured with a dip stick), simply add another tin of Amitraz and a bag of lime and fill with water again.
- (3) When not dipping regularly, just add 10 kg of hydrated lime per 2000 litres of dip wash every two months and stir it in.
- (4) As with any dip, regular sampling is strongly recommended to keep the dip up to strength.

Managing an Amitraz dip is a simple business. No measuring out is required either at charging or topping up, because of pre-measured tins. Maintenance is just a matter of adding more lime from time to time. Amitraz cattle dips include Taktic, Amitik and Nu-Tic.

Pour-on cattle tickicides

Glen Sibson, District Inspector of Stock, South Johnstone

The pour-on method is ideal for use in tick control programs when dip and spray race facilities are unavailable. It is more effective and time saving than hand spraying.

Available tickicides

Available pour-on tickicides are Bayticol, Ivomec, Cydectin and Acatak. Compared to conventional tickicides, Bayticol Pour-On is relatively expensive, but the longer protective period reduces the number of treatments required during the season.

Stock in the draining pen after exiting a plunge dip. Excess fluid falls from the cattle and is returned to the dip vat.



Ivomec and Cydectin have the advantage of also controlling internal parasites but do not give a long protective period. More frequent treatments therefore make the cost of tick treatment higher.

Consequently, the use of these products for tick control can only be justified when treatment for both internal and external parasites is required. Acatak gives the longest protective period with its action as a growth regulator preventing ticks from reaching the adult stage.

The effectiveness of these products depends on correct usage, particularly in relation to dose rates and method of application. As the correct dosage relates to animal weight, weighing of stock is recommended.

Effectiveness

These products differ from conventional tickicides in that they are not good tick-detaching agents and ticks may be found on treated animals for some time after treatment (3–21 days). However, these ticks are often infertile and may not produce any larvae.

With Bayticol, larval ticks are prevented from attaching for 2–3 weeks which means that adults will not be seen for 5–6 weeks after treatment. Acatak does not prevent larval ticks from attaching but does stop these larvae from moulting through to nymphs and adults for 9–15 weeks.

Rainfall may shorten the protective period of Bayticol but does not reduce its efficacy. Acatak is unaffected by rain. Bayticol will not control Parkhurst or Lamington strains of resistant ticks. To date, there is no tick resistance to the other pour-ons.

Other parasites

Bayticol may be effective against buffalo fly for approximately 10 days, depending on the presence of resistance to synthetic pyrethroids. It also controls scrub ticks and New Zealand cattle ticks when used at 14–21 day intervals (depending on the level of infestation). No control of cattle lice is claimed.

Ivomec can control sucking and biting lice, mange mites and buffalo fly for up to 21 days, and internal parasites for 14–28 days. No claim for other ticks is made. Cydectin controls internal parasites and sucking and

biting lice. There is no claim for control of three-host ticks. Acatak only controls cattle ticks.

Dose rates

Bayticol is applied at a rate applicable to liveweight ranges. Dose rates have been calculated for body surface area, and this should be taken into account when treating animals in poor condition.

Table 12 Recommended rates for Bayticol Pour-On

Class	Weight (kg)	Dose volume (ml)
Calf	Up to 150 kg	35 ml
Weaner	151–300 kg	55 ml
Adult	301–500 kg	75 ml
Heavy adult	501–750 kg	112.5 ml

The dose rate for Ivomec Pour-On and Cydectin Pour-On is 1 ml per 10 kg liveweight. Acatak is applied at a rate of 3 ml per 50 kg liveweight. Under no circumstances should cattle be treated with less than the recommended dose, as this aids the development of resistant ticks.

Application

Special applicator guns have been developed for each of these pour-on tickicides: Bayticol, Ivomec and Acatak. These specific guns are the only ones to be used. Any applicator gun with the appropriate calibrations may be used for Cydectin.

For application to small groups of animals, squeeze-measure-pour dispensers are available for Ivomec and Cydectin. Graduated beakers are available for use with Bayticol on small groups of cattle.

The Dead Liner Bayticol gun is set to deliver the full dose in two squeezes with a line down each side of the backbone from in front of the shoulders to the tail. The other pour-ons should be applied as an even dose along the top of the back from the withers to the tailhead.

Table 13 Pour-on tickicide pack sizes

Product	Bayticol	Ivomec	Cydectin	Acatak
	1 litre	1 litre	500 ml	5 litre
	5 litre	2.5 litre	2 litre	
	20 litre		5 litre	
	200 litre			

Safety

These products are quite safe. Some young calves treated with Bayticol or Acatak may have some scurf develop in the hair at the application site shortly after dosing, but this will disappear after a few days.

These products can be used in conjunction with normal husbandry procedures and most drenches and vaccinations. Bayticol should not be used at the same time as other pour-ons.

Cattle recently treated with Bayticol or Ivomec should not be fire-branded as the hot irons may ignite the oil and alcohol bases used in these products. Protective gloves and clothing should be worn when using these products.

Clearing cattle

As these pour-on products are not “knock-down” chemicals, they are not as effective as conventional dipping for preliminary treatment of cattle destined for tick-free areas. Bayticol may be effective if cattle are treated four weeks prior to movement, followed by another treatment seven days before presentation at the clearing dip.

Withholding periods

Users of these products should observe the required withholding periods and export slaughter intervals displayed on the labels when consigning cattle to sale or slaughter.

Safety issues in dipping and spraying livestock

Glen Sibson, District Inspector of Stock, South Johnstone

All chemicals used to control ticks and other external parasites from livestock are toxic, so appropriate safety precautions should be observed. Highly toxic chemicals, if used in a safe manner, will not pose a health hazard. Emergencies should not arise if you read and follow the label instructions and use protective equipment correctly.

Poisoning

Poisoning occurs most commonly by absorption through the skin but can also occur by inhalation (breathing dust or mist) or ingesting. It may result immediately from a single large dose or, as is more likely the case, from small doses accumulated in the body over a period of time.

Symptoms

Early symptoms (mild effects)	Developed symptoms (severe effects)
Headache	Excessive salivation
Nausea	Excessive sweating
Dizziness	Tears
Weakness	Vomiting
Pinpoint pupils	Abdominal pain
Blurred vision	Convulsions
Nerve tremors	Rapid pulse

Treatment

Learn to recognise the symptoms and signs of pesticide poisoning. Remove contaminated clothing and wash affected areas of skin with plenty of soap and water. Take the patient to a doctor immediately together with the label description of the chemical.

Don't allow the patient to drive. Never attempt to continue working. Effects that seem mild at first can sometimes develop into serious symptoms if not treated immediately.

Preparation of chemicals before use

- Handle concentrates with extreme care as they are far more hazardous than diluted spray mixes.
- Always use protective clothing.
- Read the label carefully for directions for use as well as safety precautions.
- Mix in an open, well-ventilated area. Wash with soap and water immediately on coming in contact with concentrate.

TickGARD PLUS *cattle tick vaccine*

Glen Sibson, District Inspector of Stock, South Johnstone

TickGARD PLUS is a cattle tick vaccine which has been developed by Biotech Australia in conjunction with the CSIRO. TickGARD PLUS acts in a completely different way from all other tick treatments by utilising the cattle's immune system to attack the tick. Instead of causing rapid “knock-down” of the tick as a chemical treatment would, TickGARD PLUS works by continuously damaging the tick as it feeds.

How it works

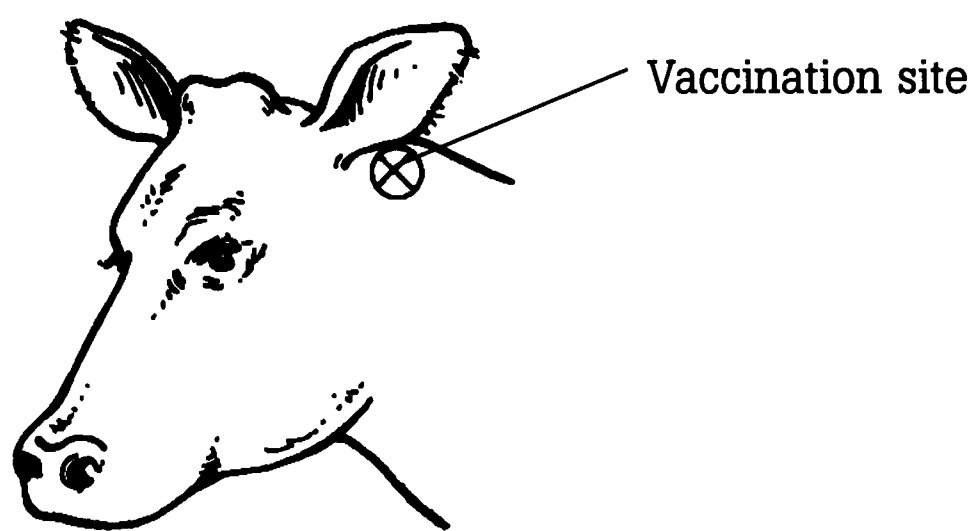
TickGARD PLUS contains a protein from the gut of the cattle tick. When cattle are vaccinated, their immune system produces antibodies against this protein. When ticks feed on a vaccinated animal, these antibodies attack the tick's gut and damage it. This damage has the following effects:

- Fewer ticks survive to adulthood.
- The surviving adults are smaller and have a lower egg output.
- Fewer of the eggs that are laid will hatch and survive.

Thus the vaccine works on the tick's future generations by reducing its breeding ability and any build-up of tick population.

Control program

As the vaccine's control of ticks is not total, its use has to be combined with chemical treatments. The vaccination program consists of a single priming dose followed by a series of booster vaccination doses. The priming dose does not have full effect against ticks, but rather prepares the animal to respond fully to later booster doses. The priming dose is a “once in a lifetime” vaccination and should be given 4–16 weeks before the boosters are needed. Booster doses are required at 10-week intervals to maintain antibodies at an effective level.



Recommended vaccination site for cattle. To minimise carcase loss in the event of infection, all vaccines should be given in the least commercially valuable area.

The basis of an integrated tick vaccine control program is to use chemicals to establish control on rising tick numbers at the start of the season or during seasonal tick surges. TickGARD PLUS is then used to prolong and maintain that control.

As each property's tick situation is different, it is important that a tick vaccine control program is designed specifically for that property. Your local stock inspector has a detailed knowledge of the cattle tick life cycle and its breeding dynamics in your area, so is best able to advise on a program for each situation.

Advantages of TickGARD PLUS

- No withholding period for meat or milk.
- No residue problems.
- Reduces the number of required chemical treatments.
- Effective against dip-resistant ticks.
- Fewer dippings will delay the development of dip resistance.
- Registered for use in lactating dairy cattle.

Disadvantages of TickGARD PLUS

- Not a “stand-alone” product, it still has to be combined with chemical controls.
- Cattle have to be in forward store condition or better for full immune response to be achieved.
- Re-boosting required at 10-week intervals for full effect.

- Control is paddock-specific, that is, vaccinated cattle moving into ticky paddocks require chemical treatments.
- A swelling at the site of injection is common.

Important points to remember

- TickGARD PLUS is not a tick “knock-down” treatment.
- Reduce the tick population with chemical treatments prior to booster vaccination.
- Treat all cattle down to one month of age.
- Use the vaccine as part of a planned program, not in an ad hoc way.

Livestock regulations



Livestock movements

Barry Torenbeek, Regional Inspector of Stock, Townsville

Queensland's current livestock movement requirements were implemented on 1 March 1994. These changes came about because Queensland is now free from most of the major stock diseases. The majority of livestock movements do not pose a disease risk and the need for regulatory control has lessened.

The object of livestock movement control is to enable traceback when diseased animals are found, and to limit the movement of diseased stock. Property tail tags allow accurate identification of individual animals. Waybills are required to be completed in duplicate. The original travels with the stock, the copy remains at the property of origin. Each must be kept for two years.

Stock travel permits

Travel permits are required for all stock travelling from the Cattle Tick Infected Area to the Cattle Tick Free and Protected Areas.

Cattle require a travel permit and a waybill from the property of origin when travelling to a clearing dip. *Horses* do not require a travel permit to travel to the clearing dip, only a waybill is required. A travel permit is also issued after stock are treated and cleared by a stock inspector. However, usually 48 hours prior notification to clearing dip inspectors is required. Diseased stock, export stock, interstate or RNA stock movements also require a permit issued by the stock inspector and a waybill completed by the owner.

To obtain a stock travel permit and discuss tick treatments before movement, contact your local stock inspector. Prior treatments may be required.

Waybills

All cattle being transported require an owner waybill. However, cattle, sheep and goats travelling less than 20 kilometres by hoof for husbandry purposes (dipping, drenching etc.) don't require a waybill unless a tick

line is crossed. Horses generally don't require a waybill except when travelling to sale or slaughter, out of the Cattle Tick Infected Area, or to interstate crossing places.

The responsibility is on *the person in charge of the holding* to:

- (1) complete the waybill *OR* ensure that the actual owner of the stock or an authorised agent of the owner completes the waybill;
- (2) ensure that the drover is given the waybill.

This means in general circumstances where an independent carrier is engaged to remove stock, by law the carrier should not be completing the waybill.

Copy waybills must be retained at the property of origin for two years and produced for a stock inspector for inspection if required. If it is not practicable to retain it at the property of origin, then it must be retained at a place approved by a stock inspector. Duplicate waybill books are available from Department of Primary Industries stock inspector centres at a purchase price of \$7.50 per book of 50 or \$3.50 per book of 10.

Tail tags

Tail tags when applied to cattle identify properties of origin and are essential in the monitoring and traceback for disease control. The tags are applied on the property of origin *before* movements to saleyards or meatworks. Property-to-property movements are exempt from the tagging regulations. Straight lines of one sex comprising not less than 20 head consigned direct to slaughter without spelling may be exempt from tagging by an inspector.

All properties carrying a greater number than 11 head are allocated a property number which becomes the tail tag number. Small holdings with less than 11 head are given district tags which are available from the stock inspector. Property tail/tags are individually numbered and the recording of the serial number can be of benefit to the property owner, since problems can be traced to a particular paddock or group.

As well as property tags and district tags, there are saleyard tags. These are supplied by the stock inspector at a cost of \$4 to the vendor, for use when tags are lost at saleyards.



Cattle at a North Queensland saleyard.

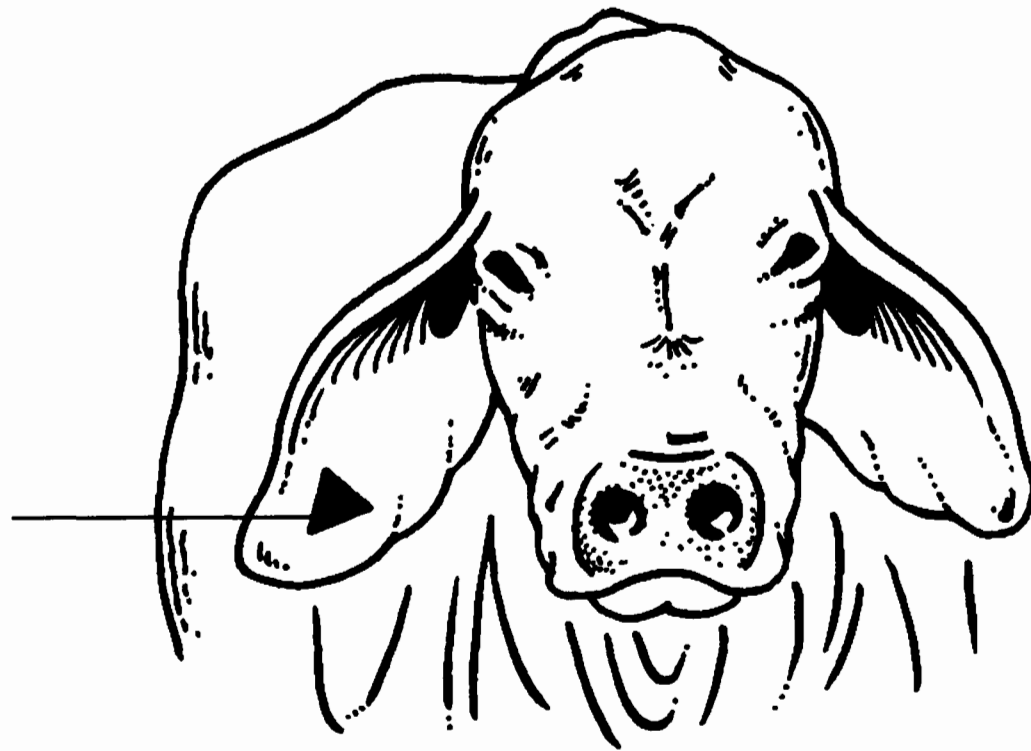
HGPs (hormone growth promotants)

Meat and offal from cattle that are known to be free of hormone growth promotants (HGPs) are allowed entry to the European Union (EU).

Producers wishing to be eligible for entry to the EU market must first be able to substantiate that the cattle have *never* been treated with HGPs. Eligible cattle must be identified with pink tail tags or ear tags endorsed with HGP FREE plus the property number. These tags are readily available from registered manufacturers upon receipt of a signed declaration on the application form. Applications for tail or ear tags are available from all stock inspector centres.

A declaration regarding HGP treatment must be provided by the owner if requested by the purchaser of store cattle mobs not subjected to tail tagging: that is, direct property-to-property movements.

HGP EARMARK
Off ear – 20 mm
equilateral triangle



European Union markets require that cattle treated with hormone growth promotants (HGP) must have a special HGP earmark.

Users of HGPs must complete a declaration at the time of purchase of HGPs, and are also required to earmark treated stock with a special triangular earmark wholly within the off ear at time of implantation. Sales of cattle to all other markets do not require HGP FREE endorsements, and white tail tags are used.

Cattle ticks

Queensland has three designated tick areas: Cattle Tick Infected Area, Cattle Tick Protected Area and Cattle Tick Free Area. Conditions apply to the movement of stock into the Protected and Free Areas. Stock must have pre-treatments by the owner within a specified period before being presented at clearing centres for clearance by an inspector. All intended movements into the Free and Protected Areas must be discussed with the stock inspector before obtaining a travel permit to move.

Suspect stock

Suspect or faulty stock are animals classed under the *Stock Act 1915* as infected stock. These stock are those which, in the opinion of an inspector, have been exposed to the risk of infection with disease in the preceding three months. Suspect stock should be consigned direct to an abattoir, and only if permitted by an inspector of stock. Suspect stock should not be consigned to saleyards.

The most commonly seen suspect stock are lumpy jaw and cancer eye cattle. Other conditions such as lameness, fever and wounds can also cause any animal to be classed as suspect. To move suspect stock, permission must be obtained from a permanent stock inspector. A permit to travel suspect stock cannot be issued if:

- the lesion is large, suppurative (discharging) or necrotic;
- the animal is in poor condition;
- in the case of eyes, the infection covers the whole eye or is present in the surrounding tissue;
- the lesion is rotting or foul-smelling;
- the animal has a high fever;
- the lesion or wound is discharging fluid or pus or could break open if bumped during transport.

If the stock inspector considers it is safe to travel the suspect stock, a permit will be issued to slaughter at an abattoir with a permanent veterinary inspection service.

If diseased stock are detected at a saleyard they cannot be offered for sale without prior approval of a stock inspector. The infected stock must be penned separately from other stock and an inspector may brand or tag the animal for identification.

Permission for the animal to travel to the nearest meatworks may be granted. If an animal is unfit to move, it may have to be destroyed without compensation to the owner. Suspect stock are not permitted to move to saleyards as they may cause disease to spread to store stock.

Clearing store cattle into Protected and Free Areas

S. M. Laffey, Cattle Tick Control Project Leader, Cloncurry

Approximately 700,000 cattle are moved annually in Queensland from the Cattle Tick Infected Area to the Cattle Tick Protected/Free Areas. Owners of such cattle are responsible for presenting them tick free at government-controlled clearing dips, where they are dipped before entering the Cattle Tick Free or Protected Areas.

Unfortunately, a percentage of cattle are held back because of the presence of live ticks, usually the result of previous treatment not being totally effective. This means cattle are held and re-treated which is costly to all parties in terms of time, dollars and inconvenience.

Cattle Tick Areas in Queensland

Under the Stock (Cattle Tick) Notice 1993 Queensland has been divided into five main cattle tick areas being:

- Cattle Tick Infected Area
- North West Cattle Tick Protected Area
- Central Queensland Cattle Tick Protected Area
- South Queensland Cattle Tick Protected Area
- Cattle Tick Free Area

For the purpose of livestock movement the Cattle Tick Free and Protected Areas are referred to as “clean” country whilst the Cattle Tick Infected Area is called “ticky” country. The division between the Cattle Tick Infected Area and the Tick Free/Protected Areas (ticky and clean country) is commonly called the “tick line”.

Over recent years the tick line has been moved several times to accommodate an increase in Tick Free/Protected Areas. The tick line location is signposted on major roads and is defined in a series of maps which can be inspected at your regional Department of Primary Industries offices.

Stock travelling requirements

For moving stock from the Cattle Tick Infected Area to the Cattle Tick Protected/Free Areas of Queensland, the following is required under the Stock Act.

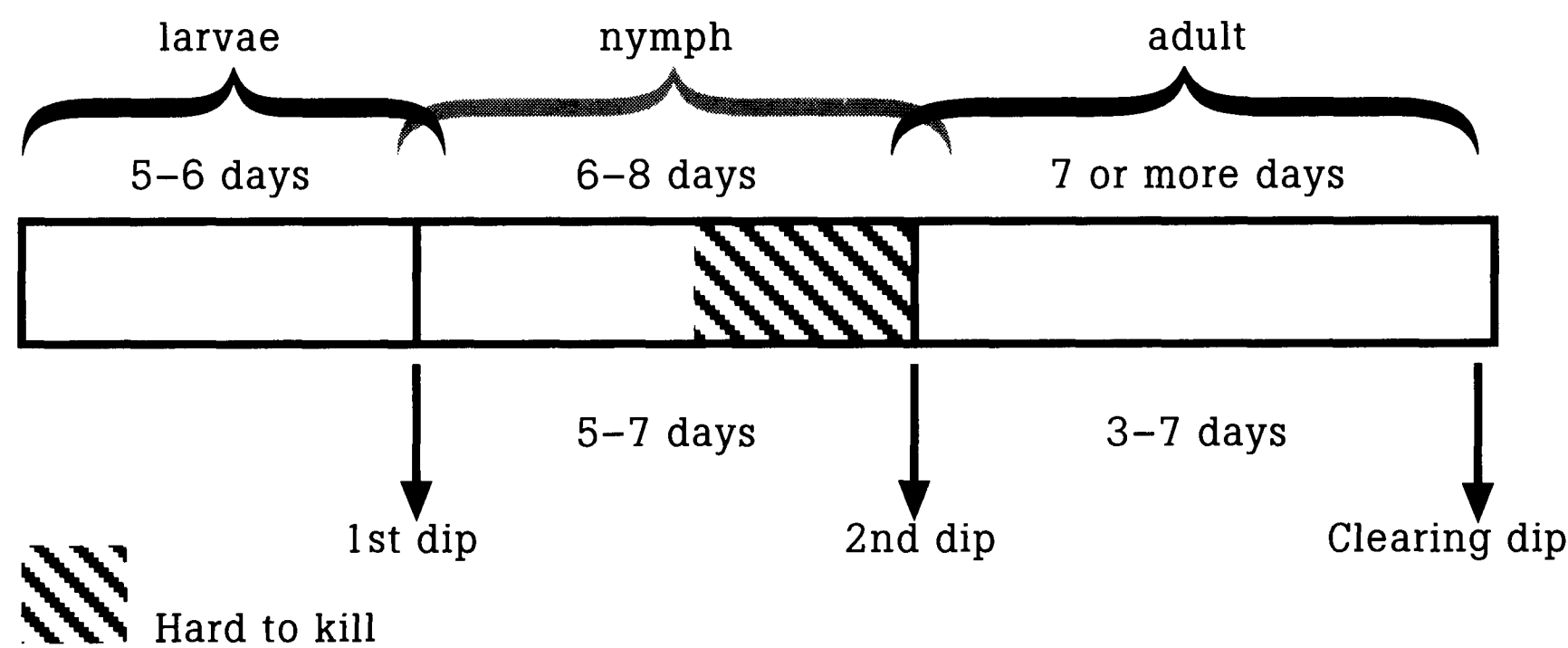
- (1) Pre-clearance treatment for cattle ticks
- (2) Travel permit (issued for movement from property of origin to the clearing dip)
- (3) An owner waybill
- (4) Clean inspection for cattle ticks followed by a plunge dipping at an official clearing dip
- (5) Travel permit (issued for movement from clearing dip to final destination in Queensland)

Pre-clearance treatment

All cattle travelling from the Cattle Tick Infected Area (ticky) to the Cattle Tick Protected/Free Areas of Queensland are required to have at least one treatment for cattle ticks prior to presentation at the clearing dip.

How cattle must be treated

Ticks are difficult to kill at two stages of their life cycle: engorged nymphs and fully engorged adults. Ticks in these stages often survive dipping or spraying. For this reason a stock owner will usually need to give stock two pre-clearance treatments. The fully engorged adult tick is not a problem because it falls off the animal after it completes engorgement. It will not be present at the next treatment. The nymph is a problem and pre-clearance treatments should be carried out at an interval of 5–7 days. The longer interval between these dips allows



Knowledge of the tick life cycle is essential to successful treatment.

nymphs to develop into young adult ticks which are easily killed by dipping. A shorter interval between dippings such as three days often results in some nymph ticks surviving both dips.

Pre-clearance treatments are usually carried out in the owner's dip. To kill all ticks on cattle these dips should be:

- Charged with an approved chemical that kills all known strains of chemically resistant ticks in that area. Local stock inspectors can advise on what type of chemical resistance could be encountered.
- Tested regularly to ensure the chemical is kept at the recommended strength. The Department of Primary Industries will test dip samples free of charge.
- Capable of thoroughly wetting each beast dipped. Ideally, cattle should enter the dip in single file. Allow a drop of at least 40 cm from jump-in point to dip fluid level. This will encourage cattle to jump into the dip rather than slide in. Spray dips are generally unsuitable for clearing cattle.

Pre-treatment with pour-on insecticide

If Bayticol Pour-On is the only chemical to be used for pre-clearance treatments, it is recommended that two pre-clearance treatments be given three weeks apart and the cattle be presented at the clearing dip seven days after the second treatment. The reason for the longer interval between treatments is that after the first Bayticol treatment (assuming no other treatments have been given) the fall-off of some ticks can be delayed for the whole of their life cycle (approximately 21 days).

Note that there are several other pour-on and injectable chemicals registered for use on cattle for controlling cattle ticks. While these are effective for on-property cattle tick control, they are less efficient than Bayticol in killing the early stages of the cattle tick, therefore these chemicals have not been approved as a "stand-alone" pre-clearance treatment. A local stock inspector can advise on the use of these pour-on or injectable chemicals in conjunction with approved tickicides as a pre-clearance treatment method.

Travel permit (property of origin to clearing dip)

This travel permit is issued by the local stock inspector for the movement of stock from the property/place of origin to the government clearing dip. Pre-clearance treatment details such as chemicals used, method of

application and treatment dates will be endorsed on the travel permit. Advice should be sought at this time on whether pre-clearance treatments and time intervals have been adequate to ensure cattle will be free of live ticks at presentation.

Owner waybill

The waybill is to be completed by the stock owner for the journey of the stock from the property/place of origin to the final Queensland destination whilst stock remain under the same ownership. The duplicate of the waybill is to be retained at the property of origin even when the stock owner is different from the property owner, for example, as with agistment stock.

Clean inspection and supervised treatment for cattle ticks

Government-controlled clearing dip facilities are strategically placed adjacent to the tick line throughout Queensland. Prior notification of intention to clear cattle is required to ensure that a stock inspector is available and that a suitable date and time can be arranged (booked).

The final treatment at the clearing dip must take place not less than three and not more than seven days after the last on-property treatment. At the clearing dip, cattle are thoroughly inspected by stock inspectors for the presence of live cattle ticks. A live tick is a tick from which fluid can be expelled when it is squashed. If cattle have a clean inspection, they will be plunge-dipped in an approved tickicide and then be permitted to move by the stock inspector. Movement must commence within 24 hours of clearance.

If cattle are found ticky (live ticks present), they will be dipped and held for re-inspection and dipping 3–7 days later. The time period to re-inspection and dipping depends on the life stages and numbers of ticks present at the initial inspection. Cattle will be re-inspected and dipped until they receive a clean inspection, after which they will be dipped at the clearing dip and permitted to move.

Travel permit (clearing dip to final destination in Queensland)

Once stock have been inspected free of cattle ticks and dipped under supervision, the stock inspector will issue a travel permit for the cattle to move to the final destination in Queensland.

Inspection and treatment details are endorsed on the travel permit as are any withholding period (WHP) and export slaughter interval (ESI). Stock are required to be removed from the Cattle Tick Infected Area within 24 hours of clearance, otherwise they will be redipped just prior to movement.

Ticky cattle at clearing dips

The chief reasons for finding live ticks on cattle at clearing dips are:

- The interval between dippings is either too long or too short.
- Dipping in under-strength or badly fouled dips.
- Incomplete wetting (dry ears and heads).
- Heavy rain on the day of dipping.
- Inclusion in the mob of cattle that have not had a full program of dippings.
- Ticks are resistant to the chemical in the dip.
- The use of badly designed plunge dips or inefficient spraying equipment.

Rejection of cattle at a clearing dip is costly and inconvenient to both the owner and the transporter. It can also place undue strain on holding facilities at the clearing centre. In many cases cattle have to be handfed or a drover hired to attend the cattle in laneways or on stock routes. Clearing cattle is a job which cannot be rushed, and thoroughness is of absolute importance. Owners should ensure pre-clearance treatments are effective.

Further information

The above information relates mainly to the movement of store cattle. Further information on the clearance of slaughter cattle on direct consignment to meatworks, and the clearance of horses and sheep can be supplied by local stock inspectors. The inspector can also advise the location of clearing dips, and telephone numbers of the stock inspectors in charge.

Branding of livestock

Peter Carroll, Project Officer, Brisbane

A stock brand is registered for use anywhere in Queensland, but initially for use on the property specified by the applicant. The use of the brand elsewhere in the state depends upon the brand not conflicting with other brands in that locality. Legal proof of ownership of livestock in Queensland is determined by the brand, in the absence of evidence to the contrary.

Size of brands

All characters in a three-piece brand must have a face depth of not less than 30 mm or more than 65 mm. The space between the characters must not be more than 25 mm. Three-piece brands with a sideways or lazy letter must be permanently affixed to another character in the brand.

Sale branding

All cattle of 100 kg or more liveweight must bear a registered brand before being sold. Stock with altered or blotched brands are deemed to be unbranded. Legibly branded stock are those branded in a manner decipherable at a distance of not less than 9 m.

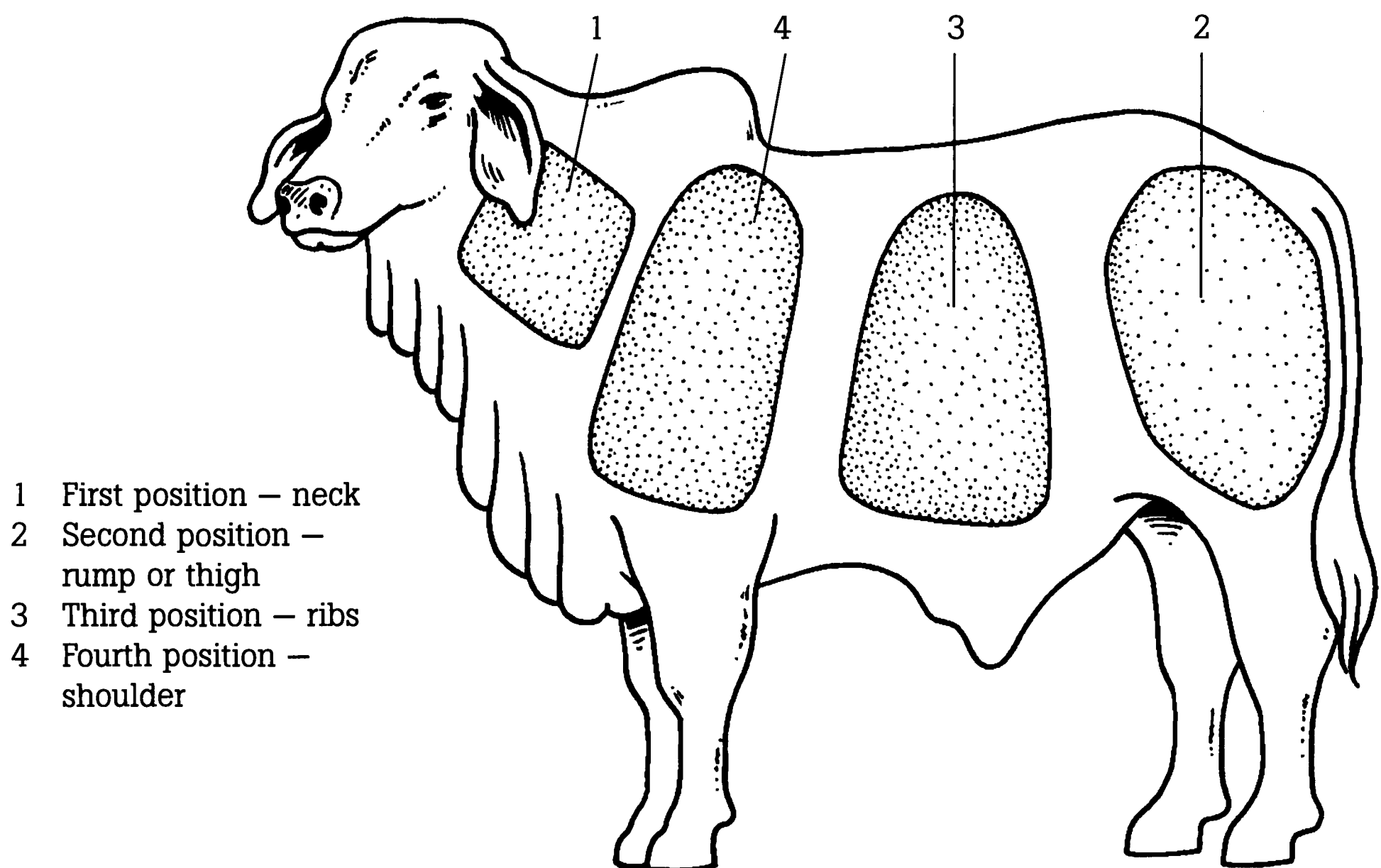
Interstate cattle

Cattle branded with a registered brand of any other state or a territory and recognised therein as evidence of ownership are deemed branded for sale in Queensland.

Brands return

The owner of a registered brand or earmark shall before the 31st January of each year furnish a return to the Registrar of Brands, which is an advice of brands currently in use. This advice to the Registrar that a brand is still in use does not replace notification of change of address or transfer of ownership.

Series	Description and arrangement	Brand components
A	Original registration of three-piece horse and cattle brands consisting of two letters and one numeral all in the upright position	
B	Original registration of three-piece horse and cattle brands consisting of two letters and one numeral with the second letter horizontal falling to the right	
C	Original registration of three-piece horse and cattle brands consisting of two letters and one numeral all in the upright position	
E	Subsequent registration of any thee-piece horse and cattle brand originally registered as Series A, B, C, F, G, H, or M which has been surrounded or cancelled and which may be re-registered	As originally registered
F	Original registration of three-piece horse and cattle brands consisting of two letters and one numeral with the first letter horizontal falling to the left	As specified for Series B
G	Original registration of three-piece horse and cattle brands consisting of two letters and one device or one letter one numeral and one device	As specified for Series A plus the device , , , except that the letter X shall be used in lieu of the letter >< and that the letter shall not be used OR
H	Original registration of three-piece horse and cattle brands consisting of two letters and one device or one letter one numeral and one device	As specified for Series A plus the devices , , , except that the letter X shall be used in lieu of the letter >< and that the letter shall not be used OR
M	Original registration of three-piece horse and cattle brands consisting of three letters all in the upright position	As specified for Series A except that the letter X shall be used in lieu of the letter >< and the letters and shall not be used



*Recommended branding positions for cattle.
 Opposite: Three-piece cattle and horse brand series.*

Cross branding

A cross brand must be imprinted immediately beneath the last preceding brand at a distance of not less than 35 mm or more than 65 mm. If, in the opinion of the brander, there is not sufficient space under the present brand, the cross brand is to be imprinted on the next position according to the table of positions. Positions follow consequently. The owner of a brand in the last position is deemed to be the actual owner of the stock.

Symbol brands registered for a specific position must be used in that position for cross branding. If space is not available, the brand must be imprinted beneath the brand imprinted last.

Notes on branding

- The brand must be readable to achieve identification.
- Replace worn, thin-edged branding irons.
- A width edge of 3–4 mm is required on the brand face.
- Wet branding results in scalded brands.
- Restrain stock securely to ensure a good job of branding.

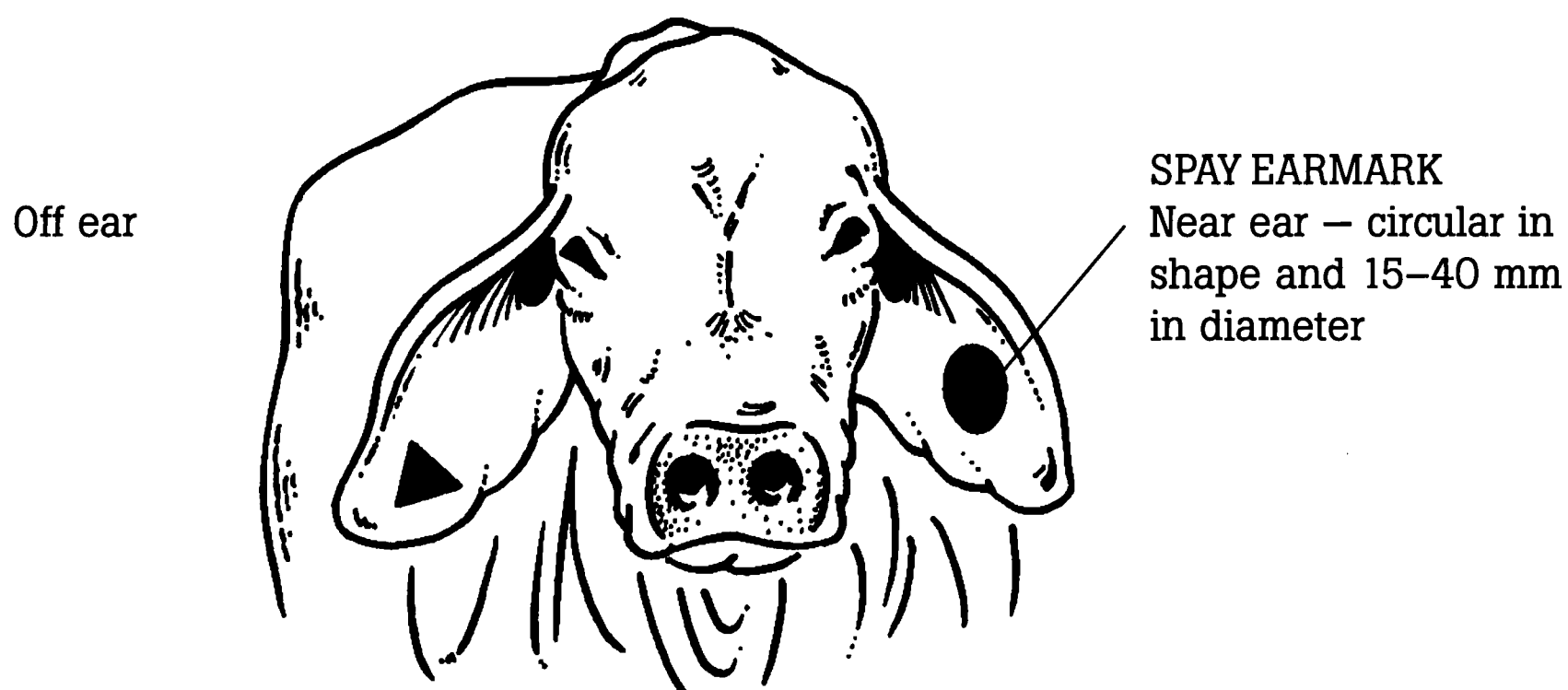
Symbol brands

A symbol brand may be any free-form shape that does not conflict with, or is not similar to, any registered brand. Symbol brands must include a dot to the right of, and in line with, the lower part of the symbol and may only be registered in conjunction with a three-piece brand. So as not to restrict the use of the more popular shapes, a table of standard additions has been developed with a written description. The face depth of a symbol brand must be not less than 30 mm or more than 80 mm.

Upon application to the Registrar of Brands, the registered owner can be allotted a specific position to imprint his brand.

Cattle earmarks

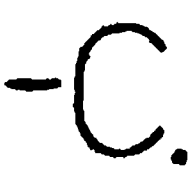
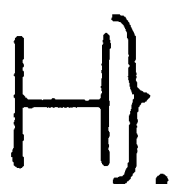
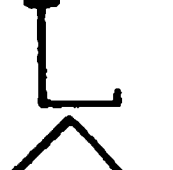
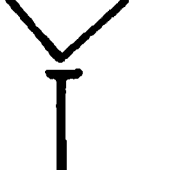
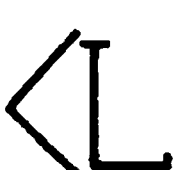
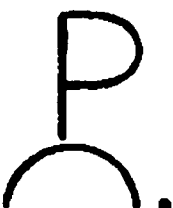
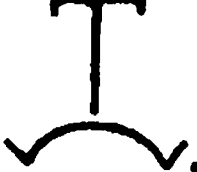
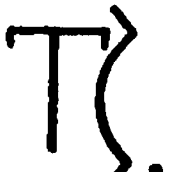
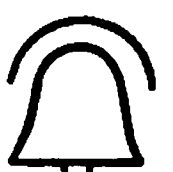
The cattle earmark is an aid to identification but does not act as legal proof of ownership. An earmark may only be used in conjunction with the three-piece brand with which it is registered, and used only in the specific earmark district of registration. A *spay earmark* is used on the centre of the *near* ear. It is circular in shape and 15–40 mm in diameter.



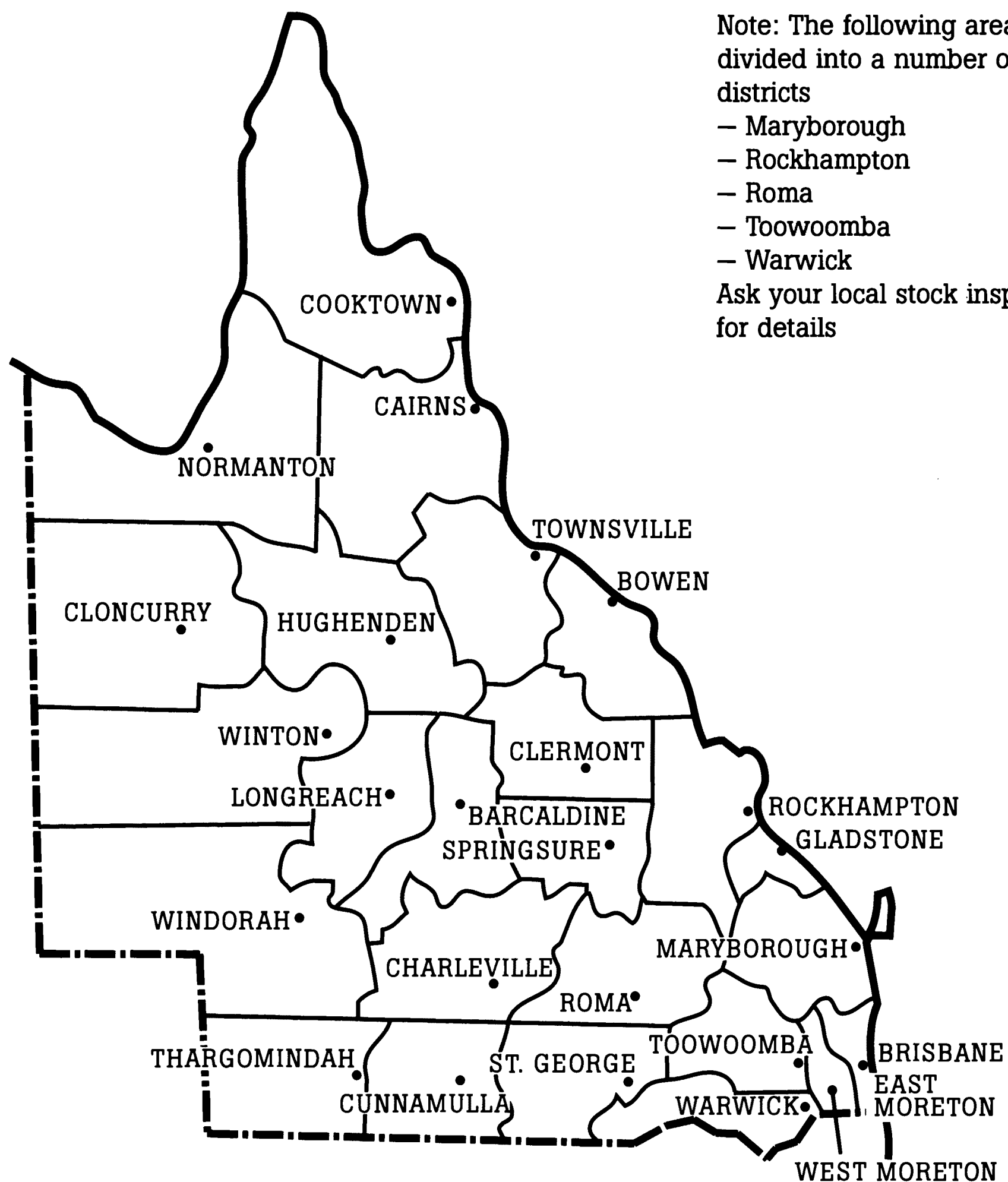
The cattle earmark is an aid to identification but does not act as legal proof of ownership.

Earmark codes and shapes

Cattle earmarks are referred to by a code of letters and numbers. The letters indicate the shape of the cut or cuts, and the numbers specify where the cut or cuts are made. The marks must be of the shape and on the portions of the ear or ears as indicated on the registration certificate.

						
Letter C under bar	Letters BC over bar	Horizontal bar & letter C	Letter C & horizontal bar	Vertical bar & letter C	Letter C & vertical bar	Letter H under bracket
						
Letter H over bracket	Letter H under inverted bracket	Letter HK conjoined over inverted bracket	Vertical bracket & letter H	Letter H & vertical bracket	Vertical inverted bracket & letter H	Letter H & vertical inverted bracket
						
Letter J under wings	Letters JB over wings	Letter J under inverted wings	Letter J over inverted wings	Vertical wings & letter J	Letter J & vertical wings	Vertical inverted wings & letter J
						
Letter J & vertical inverted wings	Letter L under angle	Letter L over angle	Letter L under inverted angle	Letters LA over inverted angle	Vertical angle & letter L	Letter L & vertical angle
						
Vertical inverted angle & letters VL conjoined	Letter L & vertical inverted angle	Vertical scroll & letter N	Letter N & vertical scroll	Letter NH under scroll	Letter N over scroll	Letter P under half circle
						
Letter P over half circle	Letter P under inverted half circle	Letter P over inverted half circle	Vertical half circle & script letters PE	Letter P & vertical half circle	Vertical inverted half circle & letter P	Letter P & vertical inverted half circle
						
Letter T under crown	Letter T over Crown	Vertical crown & letter T	Letters TP under inverted crown	Letter T over inverted crown	Letter T & vertical crown	Vertical inverted crown & letter T
						
Letter T & vertical inverted crown	Bell under half circle	Boomerang under bar	Chair over scroll	Diamond over inverted angle	Crank under crown	Apple over inverted wings

Symbol brand descriptions. Symbol brands are smaller and reduce hide damage.



Note: The following areas are divided into a number of smaller districts

- Maryborough
- Rockhampton
- Roma
- Toowoomba
- Warwick

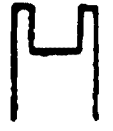
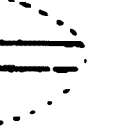
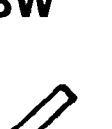
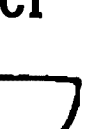
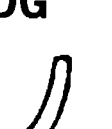
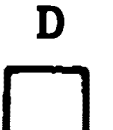
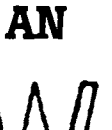
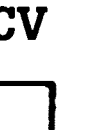
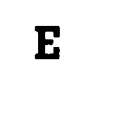
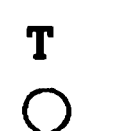
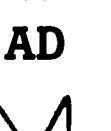
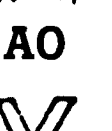
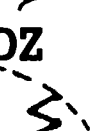
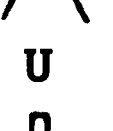
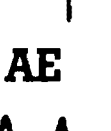
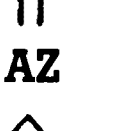
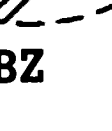
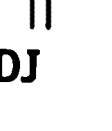
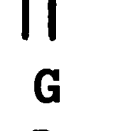
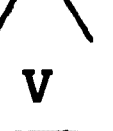
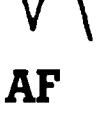
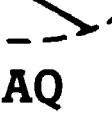
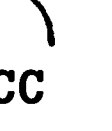
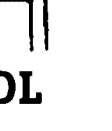
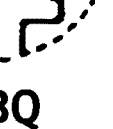
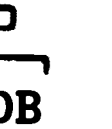
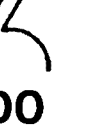
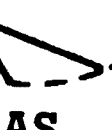
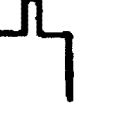
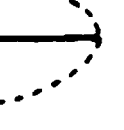
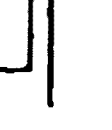
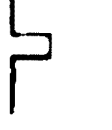
Ask your local stock inspector for details

Queensland earmark districts. A registered earmark can only be used once in each earmark district.

Legal requirements of earmarking

Registered earmarks may only be applied to cattle within the earmark district for which they are registered. It is illegal to:

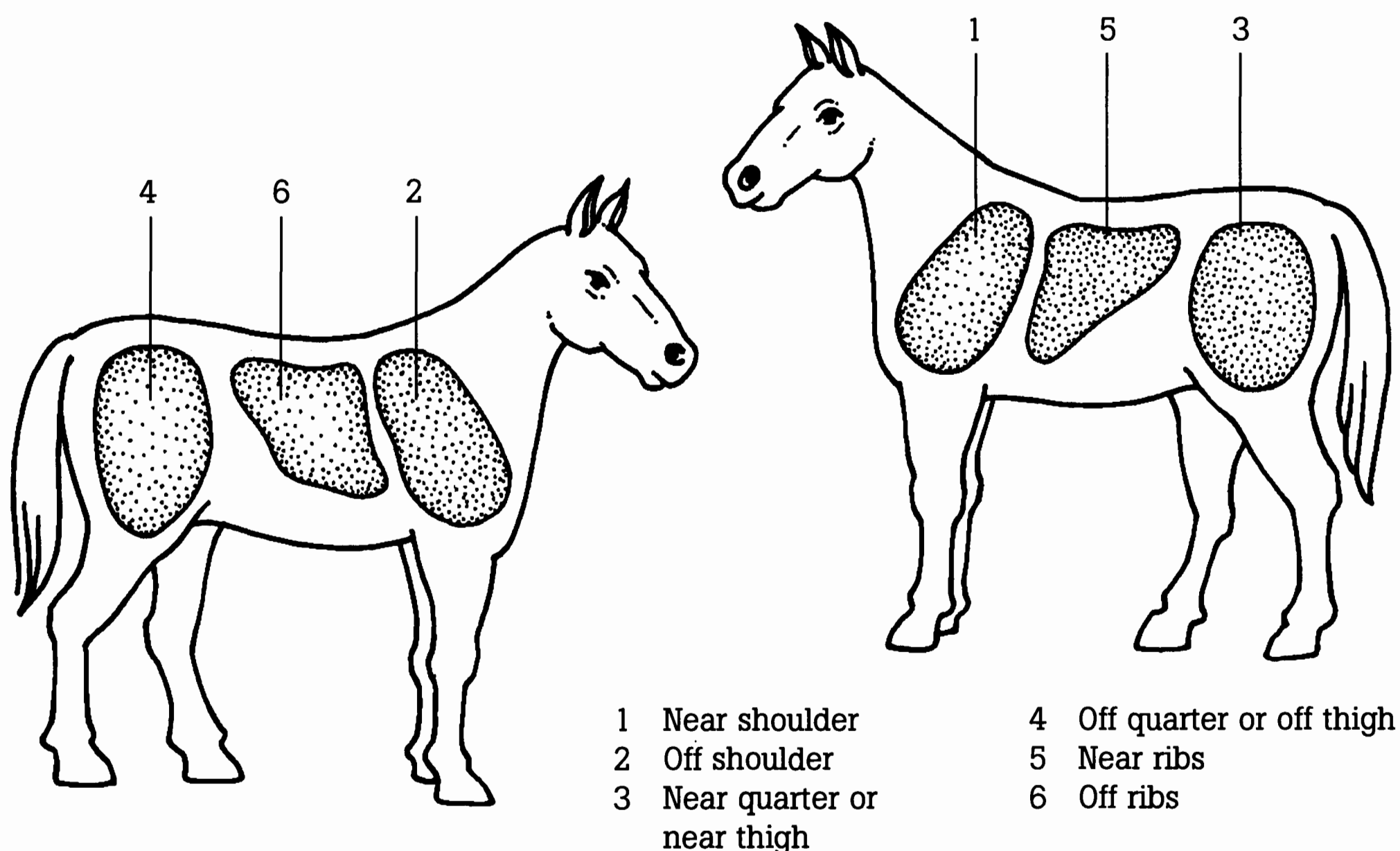
- Earmark cattle that have already been earmarked.
- Use anything other than earmarking pliers to cut the shape into the ear.
- Remove more than one third of the ear.
- Earmark cattle unless cattle are also branded with the brand registered to the earmark.

										
A	O	AA	AK	AV	BH	BV	CH	CT	DF	DW
										
C	Q	AB	AM	AW	BK	BW	CI	CU	DG	DX
										
D	S	AC	AN	AX	BL	BX	CJ	CV	DH	DY
										
E	T	AD	AO	AY	BM	BY	CK	CW	DI	DZ
										
F	U	AE	AP	AZ	BN	BZ	CL	CX	DJ	FA
										
G	V	AF	AQ	BA	BP	CC	CM	DA	DL	
										
I	W	AG	AR	BB	BQ	CD	CN	DB	DO	
										
J	X	AH	AS	BC	BS	CE	CO	DC	DP	
										
K	Y	AI	AT	BD	BT	CF	CP	DD	DU	
										
N	Z	AJ	AU	BE	BU	CG	CS	DE	DV	

Earmark codes and shapes. Earmarks provide a quick method of identification in a paddock situation.

Horse branding positions

As with the cattle brand registrations, the branding of horses with the owner's registered brand confirms ownership, in the absence of evidence to the contrary.



Recommended branding positions for horses. The most favoured branding positions are on either shoulder.

Brands Act requirements

Transfer of brand ownership. When it is intended that the ownership of a brand should change, a transfer form must be lodged with the Registrar of Brands. Brands are *not* transferred automatically through a property sale, will or brands return lodgement.

Change of address. Owners of brands are required to notify the Registrar of Brands regarding any change of address.

Health



Health characteristics, reproduction and common diseases

Steve Anderson, Inspector of Stock, Townsville

Tables 14 and 15 provide general information about health and reproductive aspects of cattle, horses and dogs. Table 16 outlines common diseases in cattle.

Table 14 Temperature, pulse and respiration

	Body temperature (°C) (daytime rectal average)	Pulse (beats/minute)	Respiration (breaths/minute)
Cattle	38.6°C	70 (10–100)	31 (27–40)
Horse	37.8°C	44 (23–70)	11 (10–13)
Dog	38.9°C	100–30	18 (11–38)

Table 15 Reproduction

Puberty		Oestrus			Gestation periods
		Duration of oestrus	Return after parturition	Recurrence if not impregnated	
Cow	12–18 months	14 hrs (10–18 hrs)	41–60 days	21 (18–24) days	282 days
Mare	12–24 months	4½–9 days	9–14 days	21 (13–25) days	336 days
Bitch	7–10 months	4–19 days	5–6 months	5–6 months	63 days

Table 16 Common diseases in cattle

Disease	Cause	Signs and symptoms	Control
Three day sickness	Virus spread by biting insects (sandflies)	Dull, head held low, animal lies down, drools saliva. Stiffness and lameness. After approx. 3 days animal resumes eating and drinking.	Vaccination
Botulism	Toxin produced by bacteria associated with decaying animal carcasses and stagnant water	Depraved appetite, bone chewing, usually animals found dead. Common in areas of protein and phosphorus deficiency.	Vaccination: Bivalent (or C and D)
Leptospirosis	Bacteria passed out in urine, survives in moist shaded areas and water	Seen mainly in calves. Signs of fever, jaundice and death. Cows may abort in late pregnancy.	Bivalent vaccine: hardjo/pomona. Leptospirosis is transmissible to humans via infected urine. Causes an influenza-like condition.
Vibriosis	Bacteria: sexually transmitted disease	Infected heifers and cows return to service. After a period of time, immunity develops and conceptions occur. Older bulls remain infected and pass on infection.	Vaccination. Vaccinate bulls and heifers also if bull control is poor.
Tick fever	<i>Babesia bovis</i> , <i>Babesia bigemina</i> , <i>Anaplasma marginale</i>	Fever, anorexia, depression, severe jaundice, red water (dark red urine). Death within 24 hours from the onset of red water. Pregnant animals often abort.	Vaccination, one is usually enough for life. For control during outbreaks: 1. Confirm the type of organism you are dealing with. 2. Treat with Imizol at 1 ml/100 kg lwt (severe cases may require 2.5 ml/100 kg lwt). 3. Use an acaricide to remove ticks. 4. Vaccinate all animals, except those treated with Imizol. Vaccinate these 8 weeks later.

Livestock vaccination

Steve Anderson, Inspector of Stock, Townsville

Many fatal or debilitating animal diseases can be controlled by vaccination. A vaccination program should be part of every management plan, or losses may turn out to be many times more than the cost of the vaccines. The objective of a vaccination program is to get maximum protection at a minimum risk and cost.

Prevention is better than cure

The decision to vaccinate, and when, is influenced by the type of stock, prevailing seasonal conditions, the previous property history, the property's location and economic factors. Most vaccines take 10–14 days to give protection so if vaccination is delayed, losses may continue. In general, if a disease has occurred on a property, it will reoccur.

Know what you are dealing with

Disease diagnoses should be done by a qualified person, as guesses are not good enough. Good communication with the local veterinarian, stock inspector or neighbours can alert you to outbreaks in the district.

Read the instructions

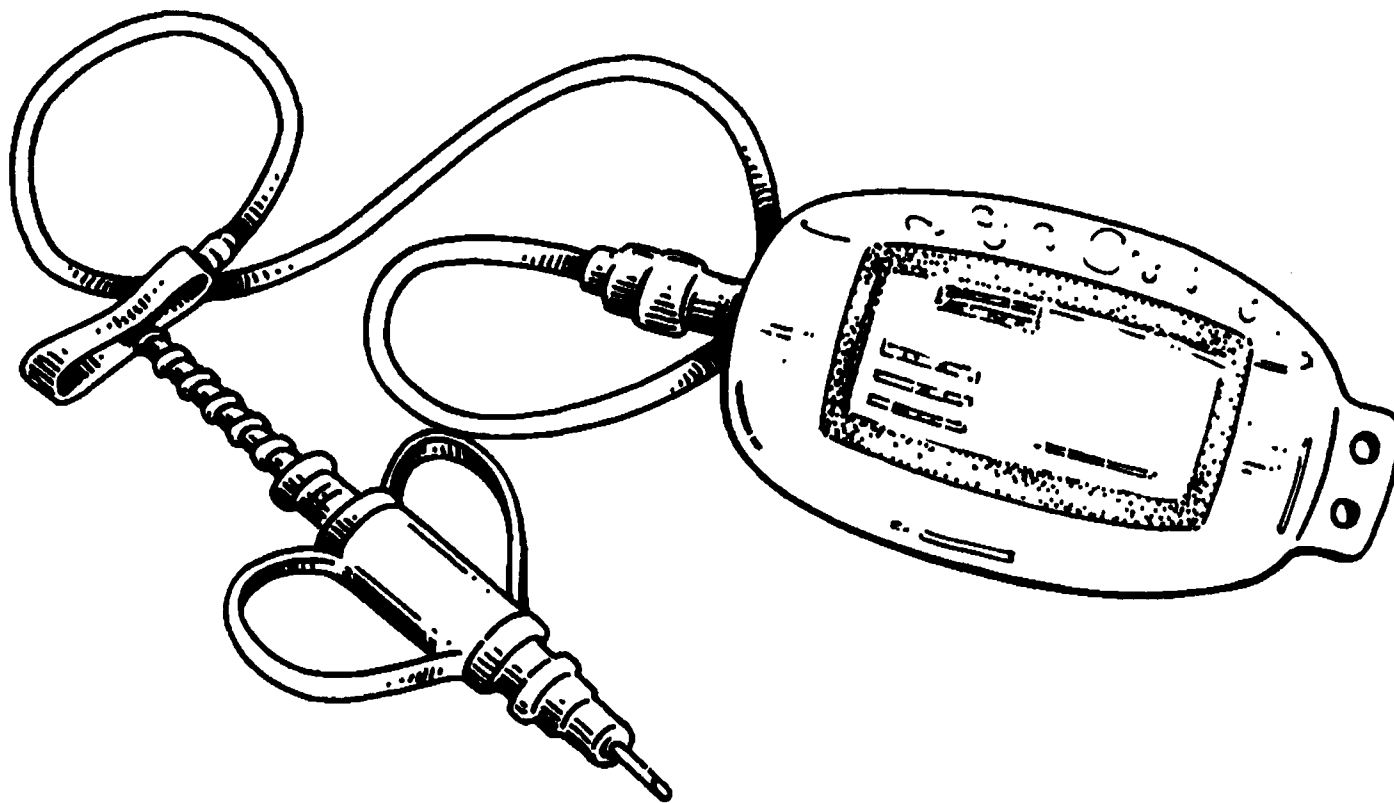
Labels carry important information on vaccine expiry dates, recommended dose rates (which may vary), the best injection sites, how to conduct a recommended vaccination program, and vaccine storage. Protect your investment. *Read the instructions and follow them.* Remember that:

- Heating or freezing destroys vaccines.
- Using ineffective vaccines is a waste of time and money.

Types of vaccines

There are three types of vaccines, and all are used differently.

- *Live vaccines* — give long immunity with one dose.



Most vaccines are packaged in multi-dosed containers for use with automatic syringes. The syringes must be calibrated and checked regularly to ensure they deliver the correct dose.

- *Inactivated vaccines* — need a booster dose to maintain immunity.
- *Anti-toxins* — give immediate short-term immunity and are not true vaccines.

Equipment

Most vaccines are packaged in multi-dose containers for use with automatic syringes which must be calibrated to deliver the right dose. They must also be sterilised before use. Sterilising a syringe is best done by boiling it for 15 minutes in a pressure cooker, or for 40 minutes in an open pan. Chemical sterilisation may be used, except for live vaccines, as the chemical may kill the living agent. Methylated spirits must not be used as the alcohol it contains may destroy the vaccine.

Needles should be sharp and as short as possible. Long needles are easier to break and may deposit the vaccine in the muscle instead of under the skin. It is recommended that 16-gauge, 18 mm long needles are used for cattle and pigs. For sheep, goats or piglets use 18-gauge, 10 mm long needles.

Techniques

Vaccination occasionally causes localised scarring or sometimes abscess formation at the injection site. Consequently, vaccination sites should be carefully selected to avoid risking the more expensive cuts of meat.

Abscesses in the neck area cause far smaller financial losses than those in the rump. For cattle the preferred vaccination site is the side of the neck. Sheep, goats and pigs should be injected behind the ear.

Commonly used vaccines

For cattle

Tick fever. This is one of the most common causes of cattle loss in Queensland. There are three types of tick fever and vaccines are produced to protect cattle against one or all of these. The vaccines are referred to as 1-, 2- or 3-germ depending on which types of tick fever organisms are included. Tick fever vaccines should be used routinely with weaners, on introduced stock and during tick fever outbreaks. Stock should *NOT* be stressed during the vaccination period.

This is a live vaccine and must be kept cool and away from direct sunlight. A single dose is sufficient for lifelong protection.

Clostridial diseases. These include blackleg, malignant oedema, black disease, tetanus and enterotoxaemia. These are usually fatal diseases in unvaccinated young stock. A 5-in-1 vaccine is available and commonly recommended, but monovalent (1 type) and bivalent (2 types) vaccines are also available. They are toxoids and require booster doses.

Botulism. This is a clostridial disease associated with mineral and protein deficiency. It is most common in phosphate-deficient country and is responsible for significant stock losses. To be effective, the vaccination should be carried out prior to occurrence of the disease. For full protection, annual booster doses are required.

Leptospirosis. Causes abortions, still-born or weak calves. It also causes deaths in young calves and mastitis in dairy cows. The vaccine is protective against strains *hardjo* and *pomona* found in Australian cattle. Leptospirosis occurs in wetter areas, is often found in association with feral pigs, and can be transmitted to humans.

Vibriosis. Causes infertility and abortions. Bulls are the major carriers of this disease. In areas where controlled mating is impossible, vaccination of bulls is essential each year. Vaccination may leave persistent lumps at the injection site.

For sheep

Clostridial diseases. These include blackleg, big head, tetanus, black disease, enterotoxaemia and caseous lymphadenitis CLA. A 6-in-1 vaccine is available, and is usually given at marking time to reduce losses from tetanus. Monovalent or bivalent vaccines are also available to suit specific outbreaks such as enterotoxaemia in fat lambs.

Scabby mouth. A live vaccine to be used in outbreaks. This vaccine should only be used with veterinary advice. The disease can infect humans.

Cheesy gland. A vaccine is now available to combat this, which is the most common disease of sheep. It has recently been incorporated with clostridial 5-in-1 vaccine to give blanket protection of young sheep. This vaccine is designed to be used on young sheep before their first shearing and annual boosters are needed. The vaccine will reduce abscesses and improve carcase values.

For pigs

Leptospirosis. This can be common in piggeries and routine preventive vaccination is necessary. Use vaccine for *pomona* and *tarassovi* strains.

Erysipelas. A common infection with several different forms. A vaccine is now available for leptospirosis combined with erysipelas.

Parvovirus. Can cause significant reproductive losses. A safe vaccine for all pigs is now available.

For horses

Strangles. Is a common infectious respiratory disease of horses. The vaccine requires three doses to be given initially followed by annual boosters.

Tetanus. Horses are prone to tetanus through wounds. An antitoxin is available for immediate short-term (three weeks) protection. This should be followed by protection with the true toxoid vaccine.

For dogs

Distemper, hepatitis and parvovirus. All are proven killers. Valuable dogs should be protected with vaccines. Annual boosters are required to maintain immunity in station dogs.

Care of vaccines

Dan Healy, Inspector of Stock, Mareeba

The use of vaccines in the livestock industries has virtually eliminated losses from many common diseases. However, unless vaccines are stored and handled correctly, their potency will fade and the animal will not get full protection. To achieve maximum protection, attention should be given to ordering, storage and administration.

Ordering

Order the right vaccine strain. Some diseases may have several strains, so it is important to order the correct strain of vaccine for the particular disease.

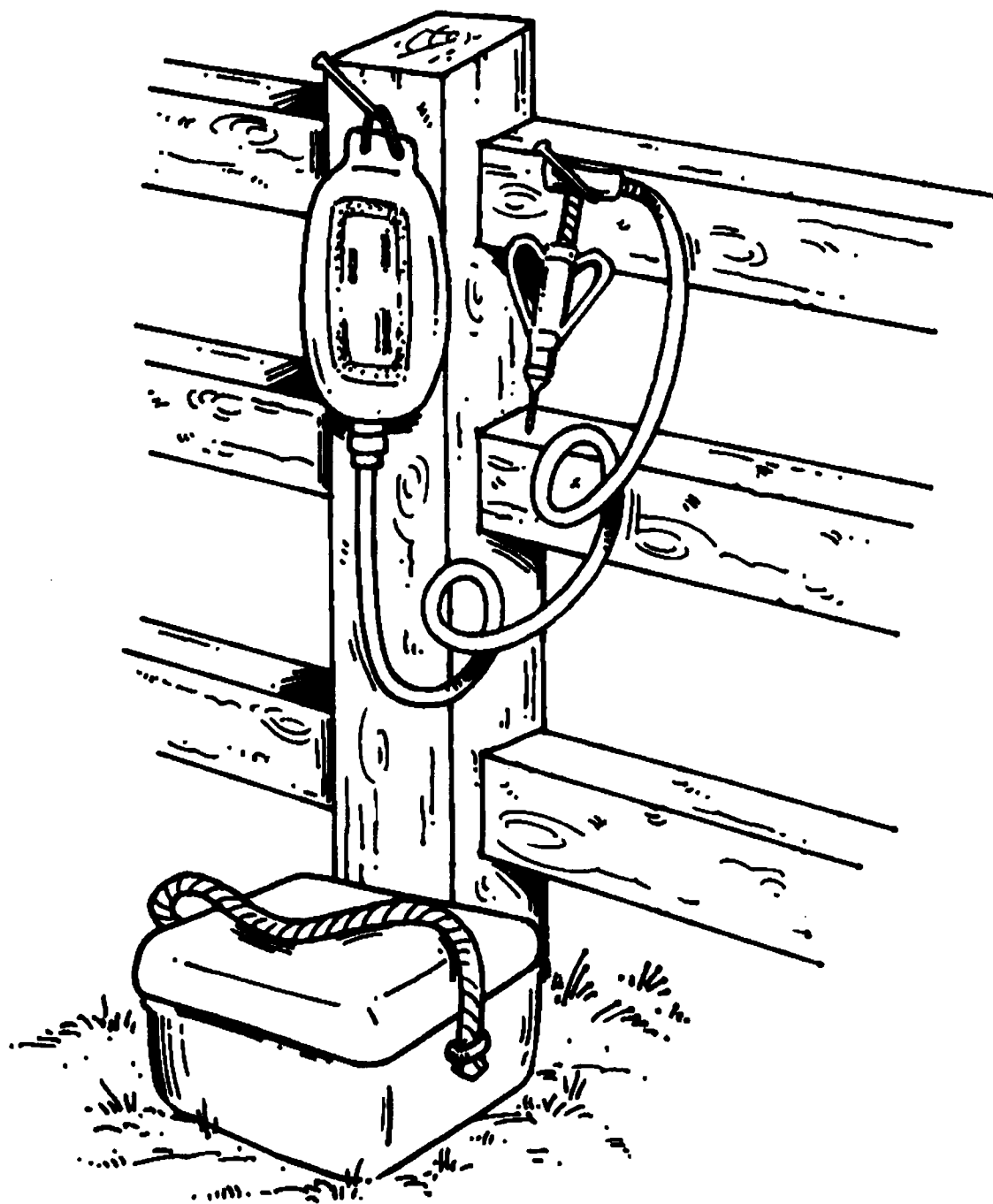
Vaccine produced by one manufacturer may contain different components to that produced by another manufacturer. When selecting a vaccine, check the actual organisms listed on the vaccine container. They will often be a better guide than the trade name.

As most vaccines are administered by a repeating syringe, ensure that sufficient doses are ordered to vaccinate all animals. Order sufficient to allow for some waste and accidents.

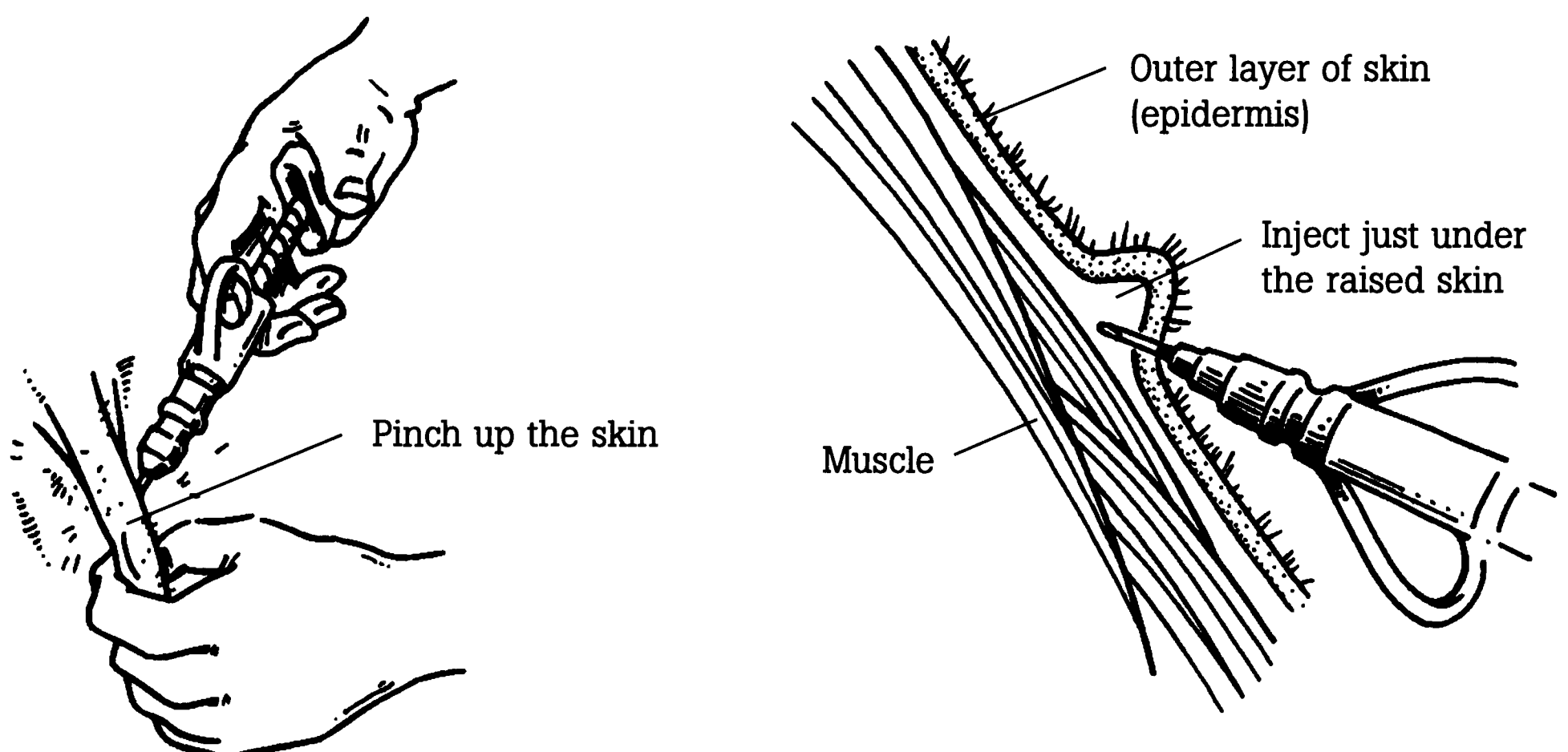
Storage

Check the expiry date of the vaccine batch. As vaccines are biological products, they will slowly lose their potency, even when stored under ideal conditions. The manufacturer has determined the expiry date for each batch of vaccine so that, if stored correctly, it will retain its full potency up to the date shown on the packets or containers. Vaccines should be ordered or purchased as required and used within the expiry period.

Most vaccines are best stored in the body of a refrigerator where they are kept cold but not subject to freezing and thawing. *A warning!* Freezing may reduce the potency of some vaccines and may cause local reactions at the injection site.



Vaccines should be protected from heat and sunlight by keeping them in an esky with chiller bricks until required.



To minimise carcase loss in the event of infection, all vaccines should be given in the least commercially valuable area.

Administering vaccines

Check how various vaccines should be used by carefully reading the package instructions. Vaccines should be protected from heat or sunlight by keeping them in an esky with chiller bricks until required. After syringes and needles have been sterilised, they should be kept in a covered container to protect them from dust.

Stock owners should not mix vaccines. However, more than one vaccine can be given at the same time by using separate syringes. These should be given in separate parts of the body, at least 15 cm apart. Syringes should be carefully checked to ensure the correct dose is being delivered to the animals. Always give the vaccine under the skin (subcutaneously) and choose the least commercially valuable site on the animal (such as the neck area). If an infection does occur, the carcase loss will be minimised.

Carefully following directions helps build a good and lasting immunity. Booster vaccinations, where appropriate, help to maintain this immunity.

Testing of blood samples is used to confirm cattle diseases such as three day sickness, leptospirosis and tick fever.



Botulism

Robert Hedlefs, Regional Veterinary Manager, Townsville

Botulism causes around 10% of all cattle deaths in North Queensland. Most cases of botulism occur on phosphorus-deficient country.

Cause

The disease occurs after cattle eat the toxin (poison) produced by the bacteria *Clostridium botulinum* which is associated with decaying animal carcasses. The bacteria can persist in the carcass (as spores) for long periods.

Signs

The toxin is extremely poisonous and animals are often found dead without any signs of illness. The warning sign to look for is a depraved appetite. Animals may be seen chewing bones, sticks or carcass material. This behaviour usually occurs when the animal's diet is deficient in protein or phosphorus. Bone fragments are commonly found in water troughs during botulism outbreaks. If several animals are found dead, without apparent struggle, then botulism should be the prime suspect.

Animals that do not die suddenly will be weak. Some may be unable to stand. A common sign is a sitting animal with the head turned back to the flank. Affected animals will be seen to eat and drink with difficulty. Affected animals rarely recover. Once an animal goes down it will die within one or two days.

Diagnosis

Because of the tiny amount of toxin needed to kill a beast, and the swift death that follows, diagnosis is difficult. The poison breaks down rapidly after death and cannot be relied upon to provide a diagnosis, but bones or other foreign matter in the paunch are good indicators that the animals had access to potentially dangerous material. Diagnostic tests are still being developed.

Treatment

There is no treatment for affected animals. Any animals that are down should be sheltered and encouraged to eat and drink. Confirmed cases should be destroyed to alleviate further suffering.

Prevention and control

This is achieved by a combination of vaccination and supplementary feeding. Vaccination is the most reliable and economic method to prevent losses. There are three types of vaccine available: type C, type D and bivalent (C and D). It is a good practice to use the bivalent (C and D) vaccine. Recent studies have demonstrated that both types of toxin can be found throughout the botulism-risk areas.

All cattle in high-risk areas should be vaccinated every year. Early advice to vaccine distributors of your requirements will ensure an adequate supply of vaccine is available.

Phosphorus or protein supplements will help reduce the number of animals that seek out carcasses to chew. Avoiding additional stresses can also help reduce outbreaks during times of potential phosphorus deficiency.

Three day sickness (ephemeral fever)

David Pitt, Principal Veterinary Officer, Townsville

Bovine ephemeral fever, commonly known as three day sickness, is a disease of cattle which is caused by a virus transmitted by biting insects. It is marked by a short fever with shivering, lameness and muscular stiffness, and is widespread in Queensland.

Ephemeral fever causes serious economic losses through deaths, loss of condition, reduced milk production, lowered bull fertility, delays in marketing and restrictions on the export of live cattle.

Animals at risk

Most of the cattle in Queensland graze in areas where ephemeral fever has occurred since 1975. Of these, the animals most likely to get the disease are between the ages of 6 and 24 months and not immunised by previous contact with the disease or vaccine. Calves from immune dams possess high immunity to three day sickness until they are about six months old.

Spread of three day sickness

The latest scientific information tells us that the virus causing three day sickness is transmitted between cattle by biting insects. These transmitting insects (vectors) have not been definitely identified, but it is likely that mosquitoes and midges (sandflies) are responsible. They are distributed over all regions where ephemeral fever has occurred.

Spread of the disease depends on the season and weather conditions. Rain plus prevailing easterly and southerly winds are necessary for the survival and spread of these insect vectors.

Clinical signs

Typically, three stages of the disease can be recognised. The *first stage* appears suddenly, especially in dairy cattle. This is marked by the appearance of fever. Animals are normal in the morning but sick by the evening milking. Sick cows stand with their backs arched and heads held low with muzzles extended. Saliva drools and often there is a discharge from the eyes and nostrils that is clear but later becomes cloudy.

A feature of this illness is pain in the throat region, and affected animals show this by refusing to swallow. Feeding and cud chewing stop and milk production, especially that of dairy cows, is reduced. Approximately half of the sick animals also shiver. Animals go down and are reluctant to rise. Good nursing and husbandry of these animals is necessary if they are to recover.

The *second stage* is muscular stiffness and lameness in one or more limbs. This lameness may also shift between limbs.

During the *recovery stage*, the great majority of affected animals resume eating and drinking. Some animals may go down for a few hours and a few may stay down for up to a week. Generally, about one animal in 100 dies, though this figure may sometimes go as high as one animal in only 10. Bulls and pregnant cows are the most severely affected.

Diagnosis

Three day sickness is normally diagnosed by the presence of short fevers, lameness, muscular stiffness and pain in affected animals and by the rapid spread of the disease through herds. Nowadays, outbreaks are usually confined to cattle under two years old. Two blood samples, the first obtained during the fever stage, and the second 14 days later are required to confirm three day sickness.

Treatment

A warning! Animals with ephemeral fever should not be drenched because paralysis of the throat muscles may allow fluids to pass down the windpipe into the lungs, causing pneumonia.

Most animals will recover if provided with shade and food and left alone. Veterinary treatment can assist recovery of valuable animals.



Cattle being moved into a race for disease testing.

Prevention

A vaccine has been developed for the prevention of three day sickness in cattle. It is available from veterinary surgeons and only cattle older than six months should be vaccinated. Two injections of the vaccine are necessary for long-lasting protection. A follow-up with an annual booster is a good management practice for bulls and high-risk animals.

Leptospirosis

David Pitt, Principal Veterinary Officer, Townsville

Leptospirosis is a contagious cattle disease. It may seriously affect beef production by decreasing branding percentages and dairy production by lost lactations and reduced milk yield.

Signs of the disease

The disease requires moist environmental conditions to survive. Acute leptospirosis is seen mainly in calves. They show signs of fever, go off their feed, pass red urine and are jaundiced. Many die within 3–5 days. Survivors are usually in poor condition for the rest of their lives.

Decreased reproductive performance can also indicate the presence of leptospirosis. It causes stillbirths and abortions in late pregnancy. A cow may show no signs of illness before or after the abortion or stillbirth. Leptospirosis can decrease a calf drop by 40% or more during a bad epidemic.

Mastitis may also be caused by leptospirosis. Cows show signs of fever and depression and go off their feed. The udder is flaccid and milk yield decreases. Milk is yellowish and may contain red flecks but usually returns to normal in 4–5 days, full production being restored after 2–3 weeks.

Spread and survival of leptospirosis

Cattle which recover may become carriers and shed the organism in their urine. If the urine is passed into an environment favourable to the bacteria — moist, shaded areas, with moderate temperatures — the *leptospira* can survive for up to six months.

Leptospirosis is common in wet coastal areas of Queensland. In drier inland areas, it is usually restricted to heavier soils which hold moisture more effectively, and areas of swampy ground or ground adjacent to watercourses.

Diagnosis

If there is a decreased branding rate in a herd or signs of an unusual mastitis, leptospirosis may be the cause. This can be investigated by collecting blood samples from about 20 cows, preferably during the wet season as this is when the disease is more prevalent. Samples should also be collected for other reproductive diseases at the same time. Laboratory examination of blood samples may reveal evidence of leptospirosis.

Treatment

Your veterinarian will advise on treatment where necessary.

Prevention

Vaccination will help prevent the disease. For an animal to be fully vaccinated, it is necessary to give two doses of vaccine, with 4–6 weeks between each dose, followed by an annual booster.

Transmission to humans

Leptospirosis is a disease which may be transmitted from cattle to humans. Symptoms can vary from fatal infection to a mild, influenza-like condition. Humans can become infected either directly by contact with infected urine when handling cattle at milking or branding, or indirectly through contact with waterholes contaminated with the organism.

Vibriosis

David Pitt, Principal Veterinary Officer, Townsville

Campylobacteriosis or vibriosis is a sexually transmitted disease caused by a bacteria in the reproductive tract of cattle. Infection in a herd reduces reproduction and prolongs the calving period.

Signs

There are no obvious signs of infection but infected cows fail to become pregnant and return to service at irregular intervals. After initial infection, cows will develop immunity and the majority will calve normally. A small number may abort later in the pregnancy. This immunity will decrease over time.

Bulls usually remain infected for life without any effect on physical or reproductive performance. Infection will establish quickly in herds with uncontrolled mating, and affected heifers will have markedly reduced fertility.

Diagnosis

Confirmation of the disease is best obtained by examining preputial washings of at least 10 bulls. Positive results from any of the bulls should be interpreted as evidence of herd infection. A new ELISA test is being trialled in cows. This involves taking a swab of the reproductive tract and forwarding it to a veterinary laboratory.

Treatment

The organisms are susceptible to some antibiotics. However, treatment of individual animals is rarely worthwhile as they become re-infected upon return to the herd.

Prevention and control

Cows that have recovered from infection have a strong immunity that will prevent re-infection for a time. The best method of control is by

vaccination. The vaccine requires two initial injections 4–6 weeks apart, followed by yearly boosters. In extensive herds, vaccination of all bulls and maiden heifers will control this disease.

Trichomoniasis

David Pitt, Principal Veterinary Officer, Townsville

Trichomoniasis is caused by a small organism that lives on the surface of genitalia. Infection is spread only by natural service.

Clinical signs

Herds with established infections will have low branding percentages and late calving, usually over a long period. These effects will greatly lower productivity. Old bulls are the disease carriers. Therefore, using bulls older than six years, having too many bulls, mixing bulls of all ages, and uncontrolled mating will assist the disease to spread.

Diagnosis

Infection is detected in older bulls. Bulls under three years old are usually resistant. A number of bulls should be examined by a veterinarian to get an accurate diagnosis. Once a positive diagnosis has been made, the infection can be assumed to be causing a herd problem.

Prevention and control

The natural resistance of young bulls and most cows can be used to effectively control the disease. It is possible to limit the effects of infection or even eliminate the disease simply by adjusting husbandry and management procedures.

The general principle is to reduce the number of aged bulls in the herd and remove any cows that may be harbouring the organism. This can be achieved by removing bulls over six years of age and all non-pregnant dry cows. Another method involves a two-herd system with young bulls and heifers separated from old bulls and cows. The aged group would be culled until trichomoniasis is eliminated.

Tick fever

Tick Fever Research Centre, Wacol

Tick fever or red water is caused by one of three blood parasites of cattle: *Babesia bovis*, *Babesia bigemina* or *Anaplasma marginale*. These parasites are transmitted to cattle by the cattle tick and invade the red blood cells of the host animal, causing a severe and often fatal disease.

Calves are more resistant to tick fever than older animals, and cattle born and raised in cattle tick country often contract tick fever as adults. All cattle born and raised in country free of cattle ticks *will* be at risk of tick fever if exposed to cattle ticks.

Common signs exhibited by affected stock include high temperature, lethargy, depression, loss of appetite, weakness, reluctance to move from shade, rapid respiration, red urine, aggressive or manic behaviour.

Options to control tick fever

There are a number of choices that can be made to minimise the risk of tick fever. These include the following.

Do nothing. Take the risk and accept the losses.

Use Imizol. This drug is used for treating tick fever infection or protecting cattle for a few weeks. It is not a long-term solution.

Manage tick exposure of weaners. Young animals up to nine months of age can acquire immunity to tick fever if they are exposed to infected ticks, but this can be difficult to control.

Keep animals tick free. This is an obvious choice. However, if tick control fails, the results of a tick fever outbreak can be very costly.

Use tick (and tick fever) resistant cattle. Pure bred *Bos indicus* cattle usually have a high resistance to tick fever, but in crossbreds this resistance varies with the proportion of *Bos indicus* blood. Department of Primary Industries records show that in Queensland since 1990, one in five outbreaks involved *Bos indicus* type cattle.

Vaccinate with tick fever vaccine. This is the most reliable long-term

method of minimising the risk of tick fever and it allows you greater control of your own situation.

There are no strict rules when deciding how to control tick fever. You need to decide what best suits your particular situation and management practices. Used separately, the options listed above may not provide you with an acceptable result. You may well find that a combination of options provides you with a better result.

Tick fever vaccination

Benefits of vaccination

- Vaccination is a cost-effective form of insurance. If you save even one animal in a year, this would more than pay for the cost of vaccination on most properties.
- It gives you peace of mind by taking the guesswork and gambling out of tick fever control.
- If you are involved in live cattle exports, it will markedly reduce the risk of your losing your disease-free status.
- If you are in a tick eradication project, vaccination will provide your cattle with the necessary protection as your herd becomes more susceptible to tick fever.

Vaccinating against tick fever is straightforward and involves injecting cattle with a dose of vaccine and monitoring the animals for possible reactions to the vaccine. Immunity (protection) develops after the reactions. One vaccination is usually enough to protect cattle for life. Revaccination is not harmful to cattle and many producers see advantages in doing so.

Recommendations

- In the tick-infested areas, vaccinate all calves bred on the property at 3–9 months of age.
- Vaccinate introduced stock on arrival in ticky country.
- Ideally, vaccinate cattle from tick-free country at least two months prior to introduction. Vaccinated cattle can be moved before or between vaccine reactions but it is not advisable to do so during a reaction. Otherwise, vaccinate on arrival at the property.

- Keep introduced (especially those from tick-free country) cattle free of ticks for 28 days after vaccination. This will allow time for immunity to develop before exposure to ticks and possible infection. Ivermectin products registered for tick control (for example, Ivomec or Cydectin) are not recommended for this purpose as tick fever infection may still occur.
- Tick fever vaccines cause very few problems and reactions are normally mild and occur undetected. As a precaution, keep cattle under close observation during reaction periods to identify any vaccine reactors. Reactions may occur 5–60 days after vaccination depending upon the type of vaccine used. Adult cattle (particularly bulls and pregnant cows) with no previous tick exposure are at greatest risk. Severe reactions normally require treatment.
- Limit stress (for example, as caused by transport or droving) during vaccine reaction periods. This will assist in minimising the harmful effects of reactions.
- It is good practice for producers in a tick-free area who regularly supply adult cattle to a tick-infested area to include a routine calf vaccination program in their property management schedule.

Choice of vaccine

Use of the trivalent tick fever vaccine is the best safeguard as it provides protection against all three tick fever parasites. Bivalent vaccine which protects cattle against two parasites, *Babesia bovis* and *Anaplasma marginale*, is also available. Both vaccines can be supplied in chilled and frozen (in liquid nitrogen) forms, with the chilled vaccine most commonly used.

Care and use of the vaccine

The vaccine needs to be carefully stored and used (the instruction leaflet supplied with the vaccine provides details). The vaccine has a short shelf life and is to be used before the expiry date. The use of other vaccines at the same time as tick fever vaccination is not recommended.

Use of Imizol

Imizol is used to treat cattle for vaccine reactions and field infections caused by tick fever. It will also protect cattle from tick fever for about four weeks when used at a high dose rate.

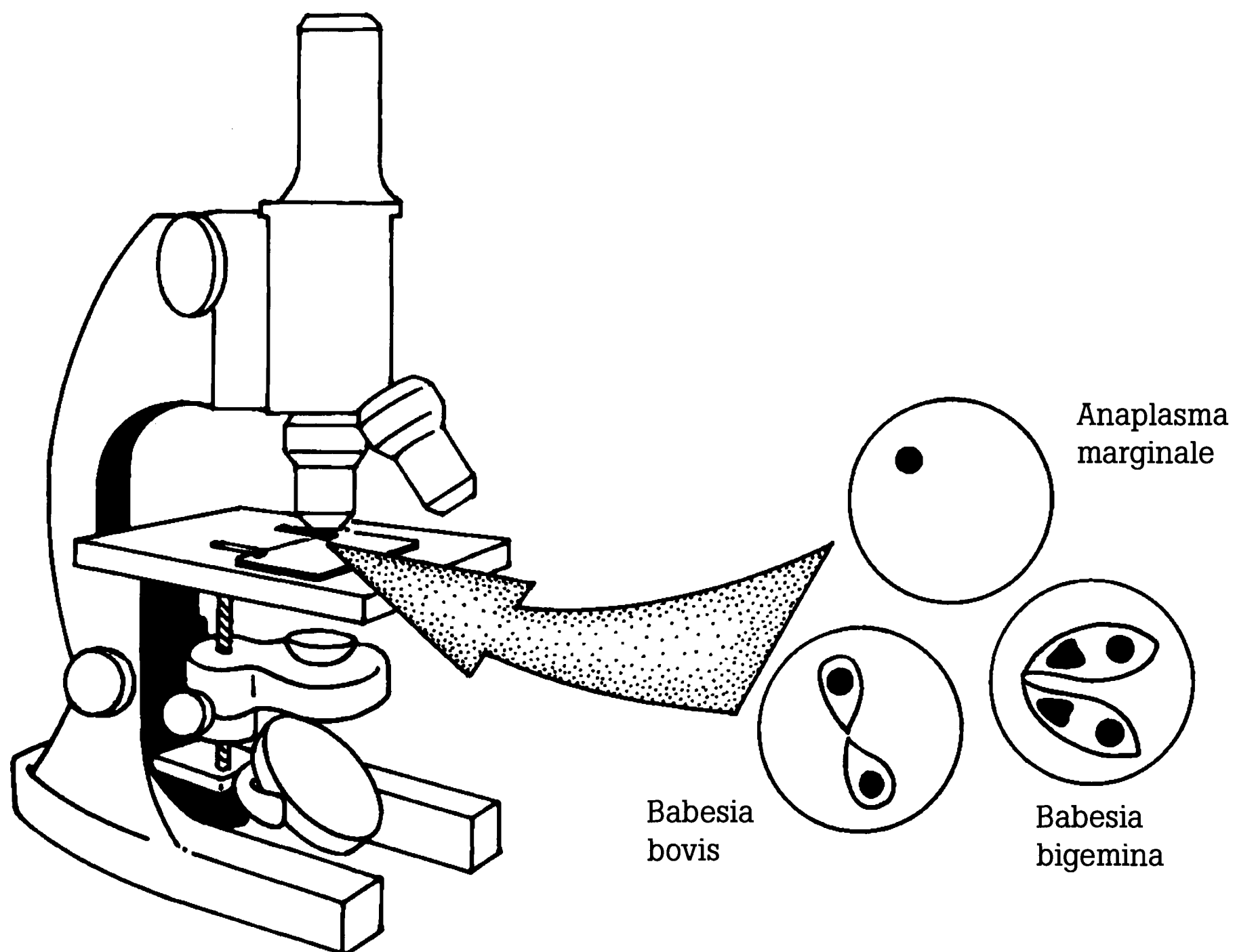
Tick fever outbreaks

If you suspect a tick fever outbreak on the property:

- (1) Treat affected animals with Imizol.
- (2) Collect diagnostic samples* (blood smears) before or just after Imizol treatment.
- (3) Treat (dip/spray) the remainder of the herd with a tickicide and watch them closely for the next 1–2 weeks to pick up any cattle incubating the disease.
- (4) If tick fever is diagnosed, vaccinate the remaining herd to stop further outbreaks.

* Note that it is important to have the cause of the outbreak identified to find out if it is tick fever and which parasite is the cause. Your private veterinary practitioner can help with this. Blood smear making kits are useful to produce suitable diagnostic samples and are available from your local Department of Primary Industries stock inspector. These officers can show you how simple it is to prepare blood smears from affected cattle for diagnostic purposes.

Laboratory identification of tick fever organisms is essential to determine the type of vaccine required.



Ordering of tick fever vaccine

Chilled vaccine is available in 10-, 25-, 50- and 100-dose packs. Frozen vaccine in liquid nitrogen is available in 25- and 100-dose packs.

Vaccine can be ordered direct from the Tick Fever Research Centre, private veterinarians, and stock and station agents. Orders received at the Centre before 10.00 a.m. can be dispatched that day.

Other information

If you want more information, the Department of Primary Industries can provide a range of detailed brochures on tick fever and the use of the vaccines. Contact details for the Tick Fever Research Centre are as follows.

Tick Fever Research Centre:
phone 07 3271 8155 fax 07 3271 3985

Buffalo fly control

Glen Sibson, District Inspector of Stock, South Johnstone

Every year millions of Queensland cattle are attacked by buffalo flies. Over the last decade these flies have been controlled by the extensive use of the synthetic pyrethroid chemicals. Unfortunately, resistance to these chemicals has developed in most areas, and control has been less effective.

Incidence of buffalo fly

In recent times buffalo flies have occurred mainly in the tick-infested area of Queensland. In North Queensland the main fly season extends from November until April, with lower numbers present for the rest of the year.

Effect on cattle

The buffalo fly is a bloodsucking insect and its bite irritates cattle. Heavy infestations cause cattle to rub themselves excessively, resulting in unsightly raw patches on their bodies. A small parasitic worm is also transmitted by buffalo fly bites adding to the local irritation.

Cattle appear to suffer most when first exposed to the flies and when other stress factors are present. Bulls, older cattle and those in poor condition usually carry the heaviest infestations. *Bos indicus* cattle can carry high numbers but do not appear to be as severely affected as other breeds. A recent study indicated that the weight gain of protected steers improved considerably.

Treatment options

The following methods and chemicals can be used to treat cattle infested with buffalo fly. Refer to Table 10 (pages 56–57) concerning the withholding period (WHP) and export slaughter interval (ESI) for control chemicals.

Back rubbers

These consist of absorbent material such as carpet underfelt wrapped



Back rubbers are economical and suitable where cattle regularly congregate or walk, such as on a pad to water, or through a gateway.

tightly around a length of chain and soaked with a mixture of chemical and oil. The rubber is suspended between two posts or trees so that cattle can rub underneath it. Back rubbers are economical and suitable where cattle regularly congregate at a central point such as a waterhole, or where they are forced to walk through a gateway.

Rubbing posts

These consist of a rope wick wrapped around a length of vertical pipe with a reservoir of liquid on top and a reservoir at the bottom. Like back rubbers, they are suitable where cattle regularly congregate at a central point such as a watering point or feed trough.

Nucidol 200, Diazinon 200, Supona Buffalo Fly and Buff Fly Di are chemicals registered for use in back rubbers and rubbing posts, though Supona Buffalo Fly is the only chemical still readily available. All are mixed

at the rate of 1 part chemical to 20 parts of clean oil. Diesel, unleaded petrol and sump oil can be used in back rubbers but not rubbing posts.

Dust bags

Ficam Gold dust bags are hung in positions where cattle can pass under them regularly, such as shade trees, campsites and gateways. As the cattle brush the underside of the bag, chemical dust is automatically released onto the animals.

Insecticidal ear tags

Insecticidal ear tags for cattle are a new concept to control buffalo flies. The Spike insecticidal ear tag and the Optimizer ear tag are a combination of Diazinon and a unique application technique. Correct application is vital to keep cattle free from buffalo flies for up to 16 weeks.

Tick control chemicals

A number of chemicals when used for tick control will also give protection against buffalo fly. These dual-purpose acaricides are: Barricade S, Tixafly, Blockade S and Grenade. They give up to 21 days protection. Bayticol Pour-On (a synthetic pyrethroid) gives 10 days protection. Note that the amidine compounds give no control of buffalo fly. Protection time depends on resistance and rainfall. Acaricides (tick killers) should be used as full body sprays.

Pour-ons

Chemical is squirted along the back line of cattle at the rate of 2 ml per 100 kg liveweight. Coopafly and Takfly (synthetic pyrethroids) give up to 21 days protection where there is no synthetic pyrethroid resistance.

Oversprays

A small amount of chemical mixture is sprayed along the back line of each animal, either in a small yard, a crush or the draining pen after dipping. Chemicals used for this purpose are as follows:

- Sumifly, Cypafly and Grenade (synthetic pyrethroids) give up to 21 days protection where there is no resistance.
- Bayofly (synthetic pyrethroid) gives up to 28 days protection where there is no resistance.
- Nucidol and Buff Fly Di (organophosphates) give 4–5 days protection.
- Supona gives 7–10 days protection.

It is important to note that protection periods will be shortened by wet weather and any insecticide resistance that may be present in the local buffalo fly population.

Producers should adhere to the required withholding period prior to slaughter or milking for any chemical used for buffalo fly control (see Table 10, pages 56–57).

Fly traps

The CSIRO and CIA (Country Industries Australia) have developed a trap that has proved effective in lowering fly numbers infesting cattle. The cattle are forced to walk through a covered-in race. Brushes hanging across the race cause most of the flies to leave the cattle and fly up to an enclosed dome where they die.

Chemical resistance

Most areas of Queensland now have populations of buffalo flies that have developed resistance to all the synthetic pyrethroids. In many cases the protection period against flies has been reduced to only 4–5 days.

Dung beetles

Dung beetles feed on the faeces and greatly reduce buffalo fly breeding through the burial or spreading of dung pads. Dung beetles carry a small mite which predaes fly eggs and first-stage larvae. It is desirable to have four or five different species of dung beetle complementing each other's activities.

Control programs

Producers must balance the cost of treating and mustering for fly control against any benefits to be gained from reduced production losses. This is particularly important where fly numbers are low. For effective control the life cycle of the buffalo fly must be broken. In other words, protection must last longer than 12 days.

Fly control methods depend on the type of enterprise and herd management. Methods will differ between beef and dairy cattle, and depend on the frequency of dipping and mustering.

Cattle lice

Dan Healy, Inspector of Stock, Mareeba

Cattle lice are parasitic insects that are present in Queensland especially in the southern areas. They prefer the milder temperatures and thrive where cattle are not dipped regularly. Hot weather does not favour lice, though animals in poor condition can be lousy in summer. The occurrence of cattle lice in North Queensland is not a major problem. However, if lice are present on cattle in the north, these animals should be treated.

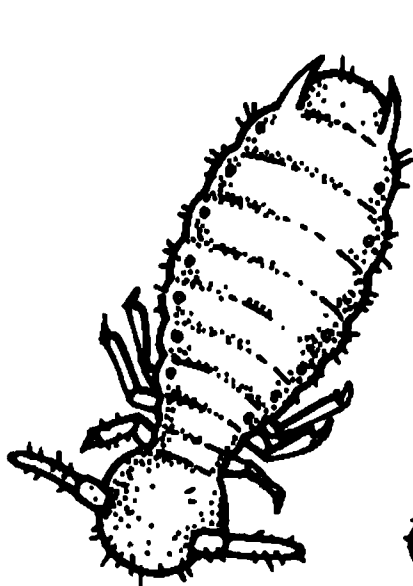
Identification

The best way to find lice is by looking very closely and inspecting several animals especially those in poor condition. Lice can usually be seen around the butt of the tail and along the back. There are two types of lice: the biting louse and the sucking louse. Both types cause irritation to the animals.

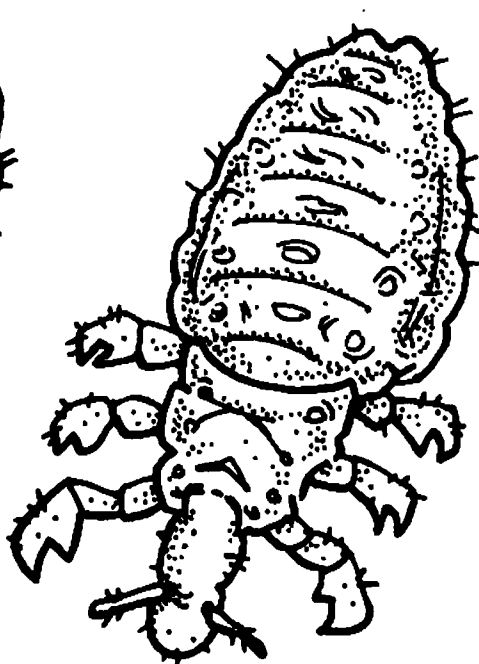
Season

Lice can be found in their greatest numbers during winter. This is also when there is little feed available and the animals are losing condition.

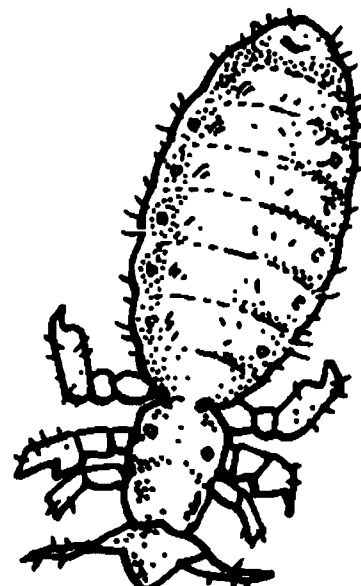
Common species of cattle lice.



Biting louse



Short-nosed
sucking louse



Long-nosed
sucking louse

Treatment

Usually it is sufficient to lower lice numbers by treating the animals once. If a producer treats his cattle once every year to reduce lice numbers, he will probably not have a lice problem in his herd. However, if the herd has large numbers of lice, more drastic measures must be taken. If you want to get rid of large numbers, treatment is done three times 10 days apart.

Animals in poor condition are more likely to have high lice numbers and are particularly susceptible to the ill effects of lice infestation. These animals should be treated first for lice. Treating drought-affected cattle for lice is strongly recommended. Such cattle have died in drought due to heavy infestation of lice.

Methods of treatment

Systemic treatment. This is the use of a pour-on or spot-on insecticide. The insecticide is absorbed through the skin and then excreted all over the body surface. Some of these insecticides also kill eggs.

Complete wetting or spraying. This is an effective treatment. It helps if cattle are packed fairly tightly into a corner of the yard so they rub the spray onto one another.

Benefits

The benefits of lice control are probably more in the appearance rather than in liveweight gain of the animals. Treated cattle look better and healthier. This often means a better price for both stores and fat cattle. Most cattlemen would agree that giving cattle every chance during winter is reason enough to treat for lice. Often only a small liveweight advantage is necessary to cover the cost of control.

There is virtually no labour cost involved provided cattle are treated when they are in the yards in autumn for weaning. *Therefore, all animals should be treated.*

Worms in cattle

The late John Fry, formerly Inspector of Stock, Charters Towers

Worm infestations in cattle are generally considered less of a problem than infestations in sheep. However, internal parasitic worm infestations in cattle can be the cause of major herd health problems. Loss of production and, in acute cases, deaths may occur from infestation of particular worm species. Species of greater importance in North Queensland include:

- *Haemonchus placei*, barber's pole worm
- *Oesophagostomum radiatum*, nodule worm
- *Trichostrongylus axei*, stomach hair worm
- *Cooperia* spp., small intestine worm

All of the above mentioned species have been isolated in a number of northern cattle herds, though not always at a dangerous level. In most cases, field evidence has shown mixed cultures with a varying species ratio.

Animals affected

In beef cattle, susceptibility to worm burdens is particularly common in younger grazing animals up to two years of age. Young animals appear to have less resistance to worm populations, and death can occur if they are not treated. Scientific evidence shows that although older animals may not be showing clinical signs, milk production levels still decline.

Individual animals also have varying degrees of resistance. Whilst some animals may be dying from worm infestations, others show only small burdens.

Clinical signs

In susceptible age groups the rate of infection can be up to 100% with varying levels of infestation. Climatic conditions and standard of nutrition are factors that can govern the rate of infection. General symptoms of a pathogenic infestation include:

- rough untidy coat and lethargic attitude
- marked loss in condition, and showing a pot belly
- scouring
- sunken eyes and paleness of the eyes and lips
- bottle jaw (swelling under the jaw).

Death is likely to occur if severe cases are left untreated.

Diagnosis

Clinical signs are easily identified in advanced cases but by this stage production levels will have declined. Suspicion of a worm burden should be greatest in the summer rainfall months.

A simple definitive test is available to measure level and type of infestation. Two fresh faeces samples should be taken from each of a range of individuals, particularly those that may be showing signs. Samples of 20 g are needed, which is about as much as you can put in a match box. Take one sample from each beast. Put one in the fridge and leave the other at room temperature. Then dispatch them to the laboratory for parasitic analysis. By culturing the eggs present, it is possible to define the species involved.

Results are given in eggs per gram of faeces. Worm egg counts above 500 eggs/g for all species of helminths is considered serious.

Treatment and prevention

Treatment should involve a strategic program of chemical treatment and paddock rotation. In more extensive situations this may not be practical, and a less intensive drenching program of all susceptible stock in the area may be appropriate.

There is a large range of commercial products on the market capable of killing these parasites. When considering the right drench you must keep a few things in mind. Some drenches are narrow-spectrum, killing only specific worms. Others are broad-spectrum, capable of killing a wide range. Make sure you know what you need to treat for. If you don't, choose a broad-spectrum drench.

The other point is method of application. Not all drenches are administered through the mouth. There is also a wide range of injectable drenches, both rumen injections and subcutaneous needles as well as pour-on products. What you choose to apply may depend on the handling facilities and the number to be treated.

Calf scours

Dan Healy, Inspector of Stock, Mareeba

Within a cattle breeding unit, one of the vital keys to success is the production of good, strong, healthy calves. One condition which can affect this aim is calf scours. A number of factors may predispose calves to scouring as well as a variety of primary causes.

Predisposing factors

Lack of colostrum. From colostrum, the calf receives antibodies against certain types of bacteria previously encountered by the dam. It absorbs them through the stomach wall for 1–2 days only. A good early supply of colostrum is therefore essential to the calf or it will be open to infection. Colostrum also contains high levels of vitamin A, protein and minerals.

Stress. Stressed animals are more likely to succumb to infection, so correct handling, access to food, and a comfortable environment are important factors.

Types of scours

Dietetic scours

This is due to digestive disorders which mainly occur during the first two months of life. It is rarely seen in beef calves on their mothers, and is usually associated with hand rearing.

Probable cause. The most common cause is overfeeding, or inadequate colostrum intake.

Treatment. In mild cases, give a dose of 30 ml of castor oil. Don't feed milk for 24 hours, giving only 30 ml glucose in as much water as the calf will drink. The daily volume of fluid given should be approximately 10% of body weight.

White scours

These are relatively uncommon in beef calves on their mothers. The common cause is the bacteria *Escherichia coli*. It may be fatal due to the organism's ability to invade the intestinal tract, producing intestinal

lesions, septicaemia and toxæmia, and preventing absorption of fluids and nutrients.

Infectivity. Infection occurs through the navel or digestive tract.

Symptoms. A yellowish, white diarrhoea with a pungent smell is observed. The calf is dull and ill, and has sunken eyes and a stiff gait due to abdominal pain. Some will die quite quickly while others may linger on with permanent damage from lung and joint infection. They become lame, weedy or pot-bellied.

Treatment. Ideally, the calf should be removed from all sources of milk. This rests the gastrointestinal tract and gives the body a chance to repair the damage to the intestinal lining. As scouring calves are usually dehydrated, they should be rehydrated.

If the calf is standing, this is done with oral electrolytes. The calf should be given about 4 litres of electrolyte each day (for a 40-kg calf) by either drenching or stomach tube. The following recipe can be used as an emergency electrolyte if a commercial electrolyte is not available.

Emergency electrolyte

1 teaspoon salt

½ teaspoon baking soda

½ cup glucose

1.2 litres water

Binding agents such as kaolin or sodium bentonite may also be given. Proprietary anti-scour powders are available from veterinarians and stock agents. As the condition is infectious, oral antibiotic treatment may be necessary. If the calf is taken off milk for a period, reintroduction should be gradual over several days.

Parasitic scours

Coccidiosis

This is a serious type of parasitic scour and can occur at 2–12 weeks of age. Signs of infection are straining and general sickness. The calf is off its feed and may waste away, becoming anaemic. Death may occur in 4–7 days. Clots of blood and shreds of mucous membrane are passed in a dark, tarry, foul smelling scour. In less severe cases the diarrhoea is yellowish and streaked with blood.

Coccidiosis is a disease which may be seen in early weaned calves, attributable to poor nutrition and poor environmental conditions. If these conditions can be avoided, calves can resist attacks of coccidiosis and build up an immunity with minimum stress, body weight loss and disruption to growth.

Black and green scours due to worm infestation

These occur at 2–12 months of age. This condition can be controlled by improving the nutrition of calves, rotating of calf paddocks, and carrying out a careful program of drenching for worms.

Tetanus

Lyle Torenbeek, District Inspector of Stock, Bowen

Cattle are susceptible to this disease which occurs throughout Australia. Outbreaks can cause serious loss of stock. Horses are extremely susceptible to this disease.

Cause

The bacterial organism *Clostridium tetani* enters the animal through wounds, burns or surgical incisions that have been contaminated with soil or manure containing tetanus spores. The bacteria produces a powerful toxin which attacks the nervous system.

Clinical signs

Signs develop 7–21 days after infection. They include stiff muscles, spasms, tremors, lockjaw, unsteady gait, and a stiffly held neck and tail. The third eyelid will become visible. Animals become dehydrated, and commonly bloat. In the terminal stages the animal falls with neck and back arched and the legs fully stretched out. Death is due to severe spasms.

Prevention and control

Treatment is not practical. Short-term prevention (10–21 days) is achieved by vaccination with tetanus antitoxin, following surgery or injury. Long-term prevention for horses involves tetanus toxoid being injected twice (4–6 weeks apart), followed by booster injections each year.

Blackleg

Lyle Torenbeek, District Inspector of Stock, Bowen

Blackleg is a bacterial disease of cattle which is rapid in onset and invariably fatal.

Cause

The bacteria *Clostridium chauvoei* multiplies in association with bruises, wounds or other injuries, producing a toxin which destroys the muscle. The organism is present in soil and the intestines of normal animals.

Signs

Blackleg will affect rapidly growing beef cattle between 4 months and 2 years of age. Animals are often found dead without warning. If found alive, they are dull, lame in one or more legs, and will not eat. Swelling occurs in the large muscle groups of the hindquarters, shoulders or neck. Swollen areas are cold to touch and may contain gas. On post-mortem the damaged muscles are dark red to black and contain bubbles of gas. Samples of this muscle tissue can be used for diagnosis.

Treatment

Large doses of penicillin given early in the disease may save the animal, but muscle loss will occur.

Prevention and control

Where blackleg is known to occur, routine vaccination of calves at 2–3 months of age, and again eight weeks later, should be carried out. Vaccination is recommended prior to putting weaners on lush, improved pasture. Carcasses of affected animals should be destroyed.

Poisonous plants of North Queensland

Dan Hogarth, District Inspector of Stock, Mareeba

Livestock often have access to a wide range of poisonous plants. Most people are familiar with the widespread distribution of plants such as rubber vine, Cooktown ironwood, heartleaf, Birdsville indigo, lantana, bracken fern, rattlepods and many others.

While it is true that some plants are highly toxic or readily eaten in quantities that can cause stock loss, most poisonings occur due to a combination of factors influenced by the animal and its condition, the plant itself, or the climate and environment.

All stockmen should be aware of some potentially fatal scenarios, which highlight the complexity of plant toxicity, and illustrate why and when it can cause deaths.

Potential for poisoning

Case 1. Very high mortality rates can occur where stock have been deprived of feed and water either due to drought or travelling long distances on transports, and are suddenly allowed access to plants which are not normally considered toxic. Pigweed, button grass and common native couch can cause deaths in hungry stock especially when the plants are young and lush.

Case 2. Some situations can cause stock to graze plants they would not normally accept, for example: rubber vine in small, overgrazed holding paddocks; weeds such as soft roly poly invading overgrazed pastures or cultivation soon after the break in a season; bracken fern “hidden” in a pasture and inadvertently eaten.

Case 3. Cattle may be introduced into country that has toxic plants of which they have had no previous experience. This commonly occurs with stock sent on agistment or store stock sent to fatten in different areas. Plants commonly implicated are lantana, Cooktown ironwood, bracken fern and heartleaf.

Case 4. During dry seasons, pasture is usually drier or in shorter supply than normal. As many poisonous plants are shrubs and deep-rooted herbs, they remain green and attractive well into the dry season. Birdsville indigo is an excellent example of this as are plants such as rubber vine, lantana and poison peach.

Case 5. Seasonal conditions can cause abnormalities in plants and water. For example, in the early 1990s a fungus appeared on Mitchell grass on black soil plains of Western Australia causing blindness, severe dehydration and death. This “black soil blindness” did not occur in Queensland. With seasons reverting to normal (that is, with no prolonged winter rain), the fungus has disappeared.

Dams and watercourses that have gone stagnant due to prolonged drought can be affected by a poisonous algal growth called blue-green algae. Any water storages that have a peculiar odour and evidence of an algal growth should be used with caution.

Rubber vine

Rubber vine is a major concern in North Queensland as a woody weed invader. Areas that suffer heavy grazing pressure such as holding paddocks and creek and river banks are usually first affected. The plant is usually unpalatable. However, poisoning can occur during the drier months when hungry cattle seek out green foliage.

Cattle and horses are affected, with cattle suddenly dropping dead when mustered. Affected cattle may appear “blue” around the eyes and mouth. Additional signs in horses are colic, profuse sweating and muscle twitching.

Cooktown ironwood

Cooktown ironwood is common on sandy soils of Cape York Peninsula and the Gulf of Carpentaria. The freshly sprouted suckers in burnt country can be especially attractive to introduced stock.

Visible signs of sunken eyes, diarrhoea and a very-tucked up appearance are common. Check the rumen of dead animals to confirm ironwood poisoning, as the dark green leaves are easily spotted. Be careful when introducing stock into Cooktown ironwood country, especially if it is dry with little other fodder available.

Birdsville indigo

Birdsville indigo is a herb. It has a central tap root which makes it hardy in dry times. It grows to form a mat on the ground and is common in Queensland.

Horses are generally affected, and mainly in the drier, arid zones, hence the name Birdsville. Horses eat the plant in the absence of other green, succulent feed. Affected horses drag their hind quarters with a high-stepping front leg gait. They rarely recover.

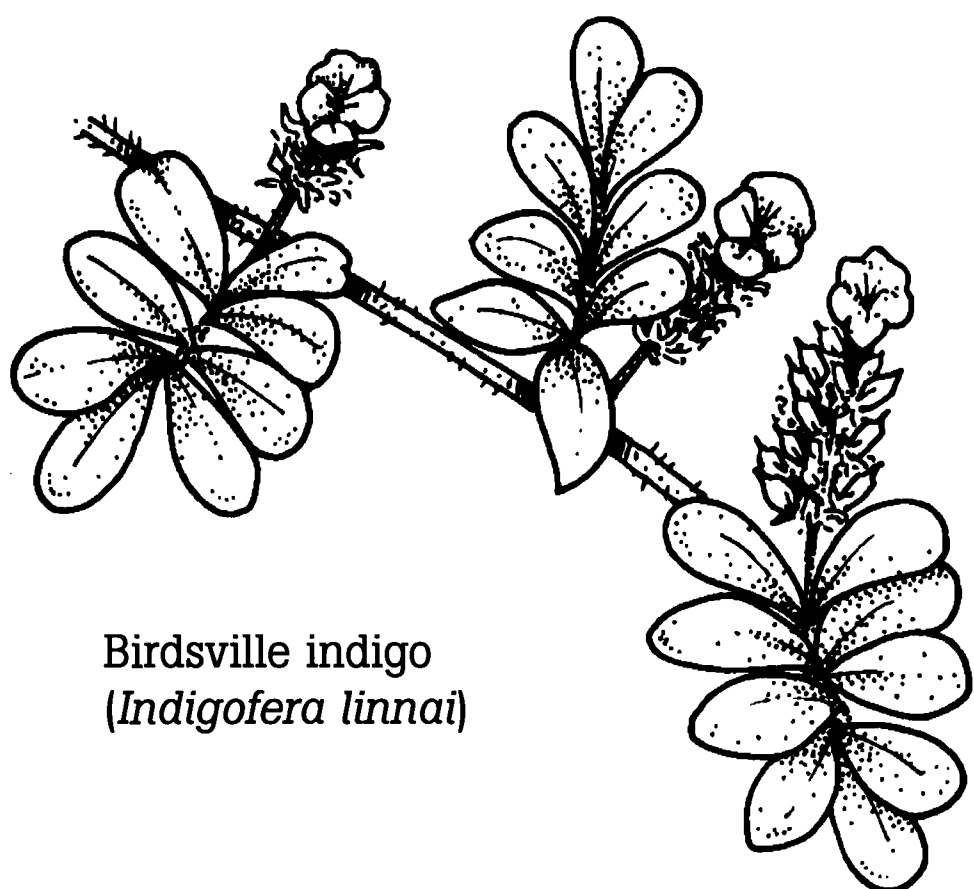
Horses should not be run where the plant occurs. However, provision of good lucerne, hay or similar supplement prevents the disease in horses. Dogs also die if they eat the flesh of affected horses.

Lantana

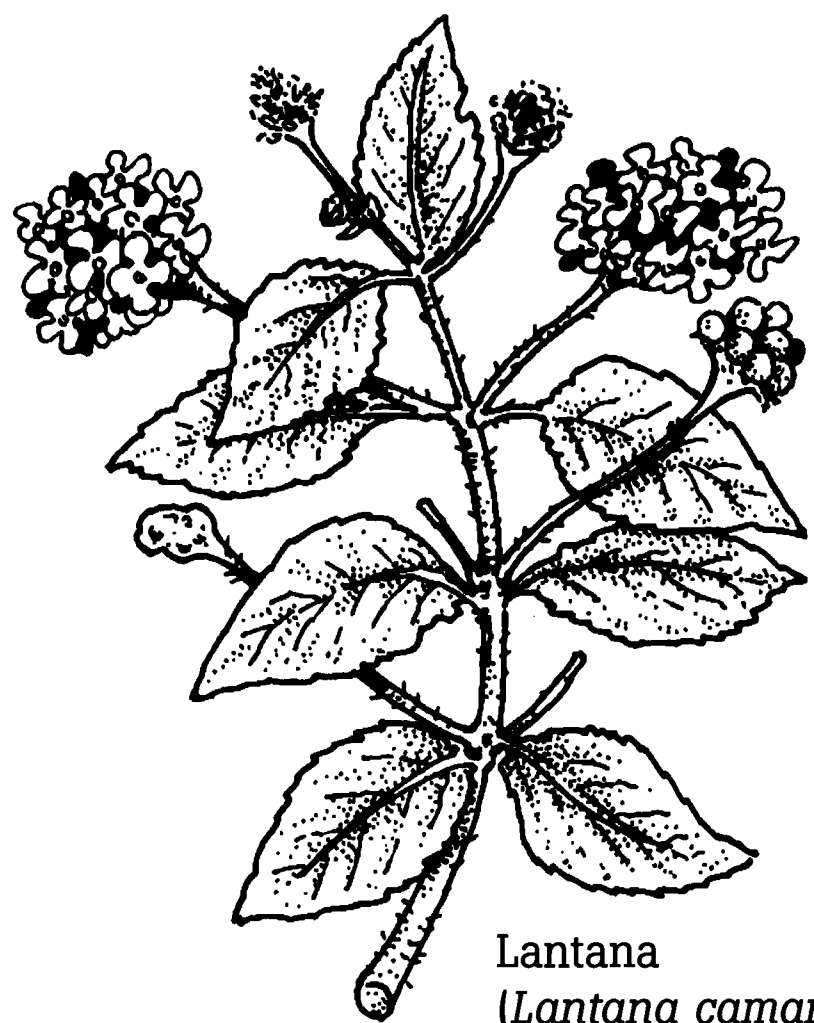
Lantana is restricted to coastal and sub-coastal regions. These areas often have fattening enterprises which source cattle from western properties. It is generally these unsuspecting cattle that eat lantana during the drier months.

The plant causes liver damage and photosensitisation. Visible signs are blistering of muzzles and ears. Provide the beast with shade and water. Deaths occur from 2 days to 3 weeks.

Livestock often have access to a wide range of poisonous plants.



Birdsville indigo
(*Indigofera linnei*)



Lantana
(*Lantana camara*)

Exotic diseases in animals

Robert Hedlefs, Regional Veterinary Officer, Townsville

Exotic diseases of animals are those diseases which are not at present known to exist in severe form in Australia. There are a great number of these diseases, but only about 12 are of serious concern to the livestock and poultry industries. These and the species concerned are as follows.

- (1) Foot and mouth disease: cattle, sheep, goats, deer, pigs
- (2) Vesicular stomatitis: cattle, sheep, goats, deer, pigs, horses and humans
- (3) Rinderpest: cattle, occasionally sheep, goats, pigs, deer, buffalo, camels
- (4) Rabies: all warm-blooded animals including humans
- (5) Bluetongue: sheep (cattle can be carriers)
- (6) Screw worm fly: warm-blooded animals including humans
- (7) Vesicular exanthema: pigs
- (8) Swine vesicular disease: pigs
- (9) Classical swine fever: pigs
- (10) African swine fever: pigs
- (11) Virulent Newcastle disease: birds
- (12) Virulent avian influenza: birds

Four of these diseases are known as the vesicular diseases. They are foot and mouth disease, vesicular stomatitis, vesicular exanthema and swine vesicular disease. While they do not affect all the same types of animals, the signs are very similar in livestock.

Why the concern?

It has been estimated that the cost to Australia from an outbreak of one of the vesicular diseases would be enormous — certainly hundreds of millions of dollars, possibly billions. The effects would be to severely restrict trade, both overseas and within Australia, of animals and animal products. In addition there would be reduced production and possibly

deaths of affected animals. People's free movement in areas subject to quarantine would be restricted.

What must be done?

To maintain our freedom from these diseases all sections of the community must cooperate. However, the actions of people close to livestock will have the greatest effect. Specific actions which must be taken include the following.

- Prevent the introduction into the country of possibly contaminated materials. Observe all quarantine regulations.
- Never allow animals or birds access or exposure to introduced products or other materials which might contain infection. Don't feed food scraps to animals or poultry.
- Be vigilant and never disregard unusual signs of sickness and death or abnormality of livestock. Report promptly and discuss the situation with a stock inspector, government veterinarian, private veterinarian, or other government officer.
- Remember false alarms are better than a widespread outbreak which may cost you and many others their livelihoods. Keep a list of contact phone numbers handy.

What to look for

Exotic diseases may not be highly fatal. In fact, foot and mouth disease normally causes few deaths, though under extensive conditions more animals might perish through inability to obtain feed and water.

Preventing spread of the disease

It is possible that some abnormal condition may be discovered at a time when stock are mustered for sale or movement to another property. Transport may be on the way. This situation puts the manager "on the spot". Does he report the situation and get advice and a solution to the problem, or does he turn a blind eye and proceed.

It is a difficult situation. However, owners have been prosecuted and fined for knowingly forwarding for sale stock infected with what could have been an exotic disease.

Table 17 Exotic diseases in animals

Disease	Common signs
Foot and mouth disease (Has occurred in Australia in the early 1800s and in 1871 and 1872)	Blisters (vesicles) around the mouth, snout, on the tongue, around the feet and between the claw, and on the teats of cows. Extra saliva drips from the mouth and swallowing sounds are heard. Lameness is related to the blisters on the feet. All four feet may be affected. Deaths of calves may occur. Blisters rupture after 24 hours leaving raw surfaces.
Vesicular stomatitis	Same as above but also affects horses.
Rinderpest	High fever with severe sickness. Animal does not eat and rapidly loses condition. Ulcers develop in the mouth and on the tongue, with development of a dry, cracked muzzle. Diarrhoea with abdominal pain, considerable thirst and heavy breathing
Rabies	“Furious” and “Dumb” forms of rabies occur. <i>Furious form</i> : animal is tense and extra-sensitive to sound and movement and is attracted to activity. It may attack (dogs and cats) or move around violently pawing the ground and biting other animals (horses) or bellowing (cattle). Excess saliva may dribble from the mouth. Final paralysis and death. <i>Dumb form</i> : animal is tired and wants to hide away. Muscle tremors and paralysis of the lower jaw with drooling of saliva. A choking cough as if something is lodged in the animal’s throat may be heard.

(continued)

Disease	Common signs
Screw worm fly	Eggs are laid at the edge of a wound or moist area of tissue such as the navel in the newborn. Within 24 hours the maggots will have burrowed into the tissues where they feed for 5–7 days. Animals are irritated and restless. By the third day they develop a fever and are sick. A large cavernous wound may develop, with death from infection and toxæmia.
African swine fever and classical swine fever	Pigs are fevered, with blotchy reddened skin. Refuse to eat, with vomiting and diarrhoea. Very high death rates may occur.
Virulent Newcastle disease (poultry only)	Breathing difficulties and nervous disorders. Weakness with watery green diarrhoea. Marked drop in egg production, possibly close to 100% death rate.
Virulent avian influenza (poultry only)	Sudden onset and rapid death. Combs and wattles may have turned blue. Have ruffled feathers and watery diarrhoea. Up to 90% death rate.

If telephone or radio communication to obtain advice is not possible, the person least likely to have had contact with infected animals should be sent in a vehicle that has not carried animals or animal products recently. And leave the dog(s) behind!

How much will it cost?

All government services including laboratory tests associated with the investigation of possible exotic animal diseases are entirely free. Private veterinarians may of course charge their normal fees. Compensation for animals destroyed to establish or confirm a diagnosis is not normally available. If an exotic disease was confirmed, national and state compensation is available should a major eradication campaign be considered necessary. This only applies to the 12 diseases mentioned at the start of this chapter.



Australia's relative freedom from exotic livestock diseases allows us access to most international live animal and meat markets.

Eradication measures

By far the most effective way of handling an exotic disease is to rapidly eradicate it from the area. Six exotic disease outbreaks have already been handled this way in Australia.

- (1) The first measure is to contain the disease in the smallest possible area.
- (2) It is necessary to destroy all infected and in-contact animals.
- (3) The causal agent in the environment must be destroyed by cleaning, disinfection and spelling.
- (4) After a determined period, test animals are reintroduced and observed for an adequate period.

In some cases, eradication may not be possible. It may then be necessary to vaccinate animals to provide buffers between infected stock and stock known to be free. Containment in this way may allow final eradication.

Where the disease gains entry to reservoir hosts or insect carriers, it may be necessary to decide to live with the disease. This might require the widespread use of vaccination programs, an additional cost industry would prefer not to have. This provides all the more reason to be careful when applying safeguards to stop the entry of unwanted viruses, bacteria and blow flies.

Exotic disease hotline: 1800 675 888

Stock horse health

Robert Hedlefs, Regional Veterinary Manager, Townsville

The following problems are most likely to be encountered in stock or pleasure horses.

Wounds

Wounds may be categorised into the following:

- abrasions: gravel rash or rope burns
- incised wounds from sharp objects such as glass or metal
- bruises from kicks and falls, where damage is more likely to be under the skin
- puncture wounds, for example, stake wounds
- lacerations, involving tears rather than cuts, usually from barbed wire.

With any wound the first stage of the healing process is rejection of dead or damaged tissues. Because of this, the wound will generally look much worse five days later, and it is often only after this time that its full extent can be estimated. After five days, healing becomes evident as scar (granulation) tissue appears. In large wounds it is often hard to control the amount of scar tissue formed. Uncontrolled granulation tissue growth results in “proud flesh”.

Bandaging of wounds is restricted to the limbs but should be used whenever possible. It supports the edges of the wound and swelling is reduced. The wound is kept cleaner and the pressure of the bandage prevents the development of proud flesh. Healing will be faster and scars less obvious. Fly irritation is also reduced.

Barbed wire cuts

These are commonly encountered in paddocked horses. They are lacerations, the barbs tearing the skin and muscles. As the blood vessels are torn rather than cut, relatively little bleeding occurs unless a major vessel is involved. Once the area has been cleaned with water and



Barbed wire cuts are common wounds in station horses.

disinfectant, any large dead pieces of tissue should be removed. This reduces the time involved for natural removal.

Daily cleaning of the wound with water removes dirty material and helps to stimulate healing. However, too much water can be an irritant, promoting too much reaction in the area (proud flesh or granulation). Once the wound is dried out and healing, water should be used sparingly. Daily dressing of the wound with an antiseptic spray or ointment is ideal. Many of these also contain a fly repellent.

Also available are products that contain an agent to break down dried discharges and dead tissue. This is useful for controlling proud flesh. Examples are Copaderm, Debrisol and DermacLens. When dealing with wounds, attention should also be given to tetanus vaccination. Antibiotic treatment may also be necessary. Seek veterinary advice for this.

Any wound below the knee or hock is potentially serious. The lack of connective tissue in that area (which is mostly only tendons, ligaments and bone) makes healing difficult, and proud flesh often occurs. Healing is helped if the leg is immobilised. For valuable animals, consideration should be given to getting a veterinarian to put the limb in a plaster cast.

Stake wounds

Stake wounds should be opened and explored thoroughly for pieces of wood or dirt. A general anaesthetic is often required for this (seek veterinary advice). Good drainage of the wound is essential to avoid pockets which can fill up with discharge and become infected.

Castration wounds

Infected castration wounds are sometimes encountered and should not be treated lightly. Infection can spread up the cord and, in time, into the abdomen resulting in the loss of the horse. The infection causes a tumour-like growth of fibrous tissue, the condition being known as scirrhus cord. To be of value, antibiotics are required when infection first occurs.

When a castration wound swells, there is usually not a lot of pain associated with it. The wound should be hosed out with clean water, by directing the stream right into the cut. Old blood clots can usually be dug out (with a *clean* finger) with very little discomfort to the animal. The most important method of preventing swelling and infection is to make sure the horse has plenty of exercise.

Hoof conditions

Regular hoof care is often neglected in the stock horses, resulting in overgrown hooves which break and crack away causing injuries such as sand cracks, seedy toe and infection of the hoof. The three basic principles of hoof care are:

- The line of the hoof wall and the pastern should, as nearly as possible, remain the same.
- The foot should be level — that is, a vertical line down the centre of the leg should be at right angles to a line across the sole.

- The foot should be kept in its natural shape — that is, no flares, no dumping of the toe, and both sides having the same degree of slope.

Sand cracks

These are cracks in the hoof wall which may extend part or all of the way up to the coronet. When the horse is moving, the edges pinch the sensitive tissues underneath causing severe lameness. Treatment consists of immobilising the edges with shoeing, grooving out the crack and, if the crack is away from the coronet, cutting a deep groove at right angles to the crack in an attempt to stop further splitting.

Seedy toe

Seedy toe is a breakdown of the hoof between the wall and the sole, at the toe. Dirt and infection work into the cavity, often resulting in an abscess that bursts out at the coronet above. Opening and draining the area is necessary, and dirt must be prevented from repacking into the area.

Canker

Canker occurs when horses are kept in wet conditions, for example, swampy ground or flood conditions. The hoof becomes soft, breaks down, and a spongy mass of horny growth appears. Treatment is a matter for a veterinarian as the horse has to be put under a general anaesthetic and all the excess horny tissue stripped off. Dry ground is a necessity.

Nail pricks

If nail pricks are treated as soon as they occur, trouble is often avoided. Antibiotics and anti-inflammatory drugs are used. However, hoof abscesses can develop and extensive removal of the sole is needed to drain the area.

Laminitis (founder)

This is an inflammation of the sensitive tissue of the feet caused by an allergic reaction to protein, particularly in grain feeds. It causes a disruption in the growth of the hoof wall so that a ridge appears around the hoof as the hoof grows. With repeated attacks a series of rings can be seen. Severe cases cause a weakening of the hoof structure and the pedal (foot) bone can break through the sole, crippling the horse.

Sudden changes of feed, for example, grain engorgement or excessive amounts of green lush feed, and overwork can cause founder. It can also be seen as a sequel to strangles and metritis or other diseases causing fever. The feet are hot to touch and the horse is reluctant to move because of the pain. The front feet are usually more severely affected so the horse adopts a crouching posture to take more weight on the hind legs.

Treatment consists of reducing the inflammation and controlling the pain. In the past, every endeavour has been made to cool the feet, for example, standing in water and mud, but this approach is now changing. Once the pain is under control, the horse is forced to walk. This improves the circulation in the feet and the chance of recovery.

Bacterial diseases

Tetanus

Horses and humans are equally susceptible to tetanus. Large outbreaks are seldom seen but since the spores are found naturally in the soil, the threat of tetanus is constant. Very few horses recover from tetanus. The spores gain entry to the body through wounds — puncture wounds being the most favourable for their multiplication. Signs of tetanus usually occur 10–14 days after the contamination of a wound. However, the spore may remain dormant for up to six months, with signs of tetanus occurring months after the wound has healed.

The horse becomes hypersensitive (easily excited) to any stimulus (noise, touch, movement) which can initiate a convulsion. All the muscles of the body go into spasms and the horse stands rigidly to attention. The give-away sign is the third eyelid which pulls across the eye and stays there during the convulsion.

It takes about three weeks for a horse to build up an immunity to tetanus toxin. If the horse is unable to eat or drink when first found, destruction is the only humane option. Less severe cases can be treated with antiserum (expensive), tranquillisers and complete quiet. Antibiotics must be administered. A recent approach to treatment, the injection of tetanus antitoxin into the cerebrospinal fluid, has improved recovery rates.

No horse should ever get tetanus, as vaccines are readily available and inexpensive. Vaccination with tetanus toxoid consists of two injections at an interval of 4–6 weeks. A third injection is given 12 months later.

Booster injection every five years are advised to maximise protection. When wounds occur in unvaccinated stock, temporary immunity can be given with tetanus antitoxin.

Strangles

Strangles and virus colds (see next section) cause similar symptoms and can be confused. Virus colds are more common than strangles and it is thought that strangles outbreaks follow outbreaks of virus colds.

Outbreaks can also occur when large numbers of horses from different areas congregate and travel for shows, events and pony club trials.

Strangles is highly contagious, large numbers of horses becoming infected. The horse has a fever and a clear discharge from the nose which quickly becomes pus-like, and abscesses develop in the glands under the jaw. The abscesses usually burst and drain, and recovery is fairly uneventful. Discharges from abscesses are infectious, and care should be exercised so as not to spread the disease from this source. They can burst internally and spread, leading to a condition known as bastard strangles.

Strangles is not the problem it used to be in the past. The bacteria, *Streptococcus equi*, is sensitive to penicillin, and treatment effectively stops the spread through the body. Laboratory culture of the organism from nasal discharge or from an abscess confirms the disease. A vaccine is available and the course consists of three injections given two weeks apart with a booster yearly. A combined tetanus–strangles vaccine has recently become available.

Virus infections

Virus colds (rhinotracheitis)

Colds are the most common infectious diseases encountered in horses. They are spread by carrier horses, and outbreaks are often seen after shows and camp drafts when a large number of horses from different areas have been mixing together.

Generally, the horse is only sick for 4–5 days and often the cold goes unnoticed. Initially, there is a clean discharge from the nose and eye which may turn pus-like due to secondary bacterial infections. These secondary infections can also cause abscesses in the facial glands which can be confused with strangles. Laboratory culture of the abscess contents will distinguish the two diseases.

A cough invariably develops which may persist for 4–6 months. This is usually the most serious aspect of this condition and requires treatment. Antibiotics are used to clear up persistent nasal discharges, and abscesses need lancing. Horses with persistent or constant coughs should receive veterinary attention.

The most important aspect of treatment for quick recovery is complete rest. It is often difficult for owners of racehorses, polocrosse horses etc. to come to terms with this. Stables should be free of dust, draughts and old bedding.

Equine infectious anaemia (EIA)

Central Queensland has the highest incidence of EIA in the state. EIA is seldom seen on the coast and when it is, the horse has usually come from the central area. The disease is characterised by intermittent fever, progressive weakness, loss of weight and anaemia of varying severity. Once a horse has become infected, it will remain a carrier for the rest of its life. Given the right conditions, relapses occur.

Symptoms vary widely, from the acute attack (fever, severe anaemia, jaundice, weakness) to the chronic attack (occasionally fever, mild anaemia, loss of weight and poor condition). Acute relapses may occur at any time, resulting in death of the horse. Conversely, a horse may completely recover, put on weight, and become a carrier animal.

EIA is spread mainly by biting insects. Contaminated needles and surgery equipment have also been incriminated. There is no known treatment of the disease. However, poor condition, underfeeding, heavy worm burdens or excessive work all seem to increase the onset of serious symptoms and death. Attention to these points will reduce the incidence of relapses.

Blood samples can be taken for laboratory confirmation of EIA. Working horses should be screened for the disease, and a management strategy implemented to prevent its spread from infected to free horses.

Skin conditions

Queensland itch

This condition is caused by an allergy to sandfly bites. The irritation causes rubbing which damages the hair and skin. The mane, neck and rump areas may be rubbed completely bald and the skin become thickened.

Spraying with repellent insecticides will help to keep the midges away but this is short-lived. Insecticides used are: Ban Fly, Fly Repella, Kuritch, Musca-Ban, Repel X, Sumifly, Y-Itch. Similarly, injections which reduce the inflammation have to be given regularly. Stabling helps, but is often not practical.

Rain scalds (Dermatophilus)

With prolonged rainy periods, the horse's skin seldom dries. Bacteria and fungi invade the surface, causing an oozing of serum that scalds the skin. The hair and superficial skin lifts off leaving large hairless areas. Antiseptic or disinfectant washes bring the infection under control, as will dry weather.

Ticks

Ticks can be a major problem to horses. Some become allergic to the tick bites, resulting in inflamed scaly areas mainly under the jaw and on neck and legs. Horses can be sprayed with any of the tickicides except Taktic. Taktic causes damage to the nerves controlling the gut which becomes paralysed. This results in colic and possibly the death of the horse unless it can be induced to eat.

Growths

The next five conditions are growths which have similarities. They have in the past all been called swamp cancers but with experience, they can be distinguished on physical appearance. For specific confirmation, samples are needed for histological examination by a laboratory.

Proud flesh (granuloma). This is an excess of tissue produced at the site of a wound. The growth enlarges slowly, is moist and soft, and is usually covered with a scab that lifts off easily. They can be surgically removed or painted with mixtures containing blue stone (copper sulphate) which burns and destroys the newly formed scar tissue. Bandages reduce formation of proud flesh during wound healing.

Warts (papillomata). Warts, caused by a virus, are commonly seen on young horses and to a lesser extent on mature horses. They can be removed surgically but usually spontaneously cure.

Sarcoids. Sarcoids are slow-growing skin tumours occurring mainly on the face and legs, occasionally on the body. Their appearance varies greatly. Some are large flat areas resembling a scar caused by a burn or

scald. Others, which are more like a skin cancer, are broad-based growths with a black smooth nodular surface. Discharges are not usual.

Attempts to cut the growths out are not very successful as regrowths usually occur. Cryosurgery (freezing) is much more effective.

Podophyllum, an anti-cancer ointment, has also been used with success. A vaccine is now available and gives better results: Equoid (CSL) or Ribigen (Websters).

Swamp cancers (phycomycosis). Swamp cancers occur when a wound becomes contaminated by a fungus. They are more prevalent in swampy areas where horses can stand in water. The growths are extremely fast growing and can be 10–20 cm across within two weeks. They occur mainly on the belly and legs and can best be described as an open, discharging mass of tissue. Yellow, cheesy spots can be seen in the growth, which is a distinguishing feature.

Treatment with antifungal paints is of limited value and extensive surgery is necessary. Spontaneous recoveries have been recorded. Research into a vaccine is under way. These are serious conditions and if left untreated soon put at risk treatment options which would otherwise be successful.

Cutaneous habronemiasis. The eggs or larvae of the stomach worm (*Habronema*) are ingested by maggots of house or stable flies, which serve as intermediate hosts. The larvae then emerge from flies where they are feeding on wounds, or on moisture round the genitalia or eyes. The larvae burrow into the tissue causing an irritation that results in a mass of proud flesh. Surgery or painting with ointments containing Neguvon is the usual approach.

For third eyelid involvement, there are reported good results using antibiotic eye ointment combined with a daily low dose of Neguvon (1/7 of a normal dose) for seven days.

Melanomas. These are cancers of the pigment cells of the skin and occur frequently in grey horses, especially around the anus and on the tail. They are hard, rounded, smooth-surfaced lumps. Removal should only be attempted if causing a problem in the saddle or anal areas. Secondary growths are common, and are the reason that horse abattoirs do not want grey horses.

Saddle sores, girth galls, saddle galls, sit-fasts and bed sores (pressure necrosis). Pressure necrosis occurs when tissue is subjected to a long,

continuous pressure, often relatively mild, leading to tissue death. This condition is caused by faulty husbandry practices such as:

- ill-fitting saddles or incorrect adjustment of buckles and saddle gear;
- poorly maintained saddlery and tackle (leather not greased, cord girths and saddle cloths not regularly washed, and counterlining hard and not replaced);
- incorrect and/or poor riding style;
- unsuitable bedding and surfaces for stabled horses.

Treatment involves removing the cause of pressure necrosis. Spell the horse to allow healing. Where the wound is moist and ulcerating, wash with an antiseptic solution, dry, then apply an antibiotic/cortisone cream (seek veterinary advice). If the wound is obviously infected, injectable antibiotics may be required. Administer tetanus vaccination boosters or antitoxin injections.

Colic

Colic means a pain in the digestive tract. Through usage, however, it now covers any pain in the abdomen which produces the same symptoms — hence the term “colicky pains” at foaling. Horses are prone to colic, as they have a low tolerance to abdominal pain and their digestive tract has numerous turns and constrictions where food can be held up.

Digestive colic can be caused by worms, sudden changes of feed, too much dry indigestible feed, unchewed feed because of bad teeth, too much highly digestible feed such as grain, lucerne and bread, or sand and plastic bags causing obstructions.

A horse showing signs of colic will kick at its belly, turn its head and look at its flank and stretch out in an attempt to urinate but little urine is passed. Because of this symptom, colic has often been mistakenly put down to kidney troubles. This belief still exists today but kidney and urinary problems are rare in horses. As the pain increases, the horse will go down and roll, temperature and pulse rate increase, and sweating begins.

Important symptoms

Two features will indicate how seriously to take a bout of colic: gut sounds and pulse rate. If you put your ear (or stethoscope) against a

colic horse's near (left) flank and you can hear no gut sounds, the animal is in serious trouble. Similarly, a pulse rate of more than 72 indicates a real problem.

Veterinary advice is required in all cases. While waiting for assistance or treatments to take effect, walk the horse to reduce desire to roll and to assist intestinal circulation. As colic is commonplace, it is a good idea to discuss with your veterinarian treatments you can administer under his direction to allow prompt treatment.

Reducing incidence

The incidence of colic can be greatly reduced by observing the following points.

- Feeding — feed good-quality feed at regular intervals and avoid abrupt changes.
- Attention to teeth — if a horse cannot chew its feed, digestive upsets will result. This is particularly important in older horses.
- Internal parasite control — the incidence of colic can be reduced by 90% if worms are controlled.

Internal parasites

Types and signs

The main internal parasites of the horse are roundworms, redworms, pinworms and bots. *Redworms* are the most important and are responsible for most of the symptoms of a wormy horse. They are a bloodsucking parasite and migrate extensively through the abdominal cavity. Larvae of the worm migrate or lay dormant in the blood vessels that feed the intestine. Interruption to the blood flow occurs, thus causing damage and pain (colic). Ruptures can occur causing the animal to bleed to death.

Roundworms are the most spectacular worm, some being 40 cm long. In general they only occur in young horses. Their migration through the lungs in large numbers can predispose to *corynebacterium* pneumonia in foals. The foals are known as rattlers because of the noise they make when breathing.

Pinworms, like human pinworms, lay their eggs round the anus. It is the irritation from these which causes horses to rub their tails. A great deal

of unnecessary importance is placed on *bots*, the maggot stage of the bot fly which are found in the stomach. Large numbers can cause ulcers and rupture of the stomach, but this is rare.

A wormy horse is usually in poor condition, loses weight, has a reduced capacity for work, rubs the base of its tail and, most importantly, shows a tendency to colic.

Treatment

When treating a horse for worms the following points should be considered.

- Choose a drug that will do the correct job.
- Ensure that the correct dose is given. Estimating the weight of the horse is most important, as horses are a lot heavier than they look.
- Ensure that the whole dose is taken.

Stomach tubing is the surest method of administering a full dose of anthelmintic. However, worm pastes are safe and more convenient, provided care is taken. Adding powder in the horse's feed is not a good method of worming as the whole dose is often not eaten. Numerous brands of paste are available. Pastes containing Neguvon as the active ingredient will be effective against bots.

Ideally, horses should be wormed when first mustered at the beginning of the season and then every six weeks. An anthelmintic that kills bots should be used twice per year, in May and October. Environmental contamination should also be reduced if possible: for example, collect manure and don't feed horses on the ground.

If horses are stabled or are in yards for long periods, a preventive worming program should be discussed with a veterinarian.

Eye conditions

Horses' eyes react severely to any form of damage and require immediate veterinary treatment. A horse may knock its eye when working in yards or in the bush and often within 24 hours the whole eye is grossly inflamed — so much so that a twitch is needed even to open the eyelids for examination.

Grass seeds and dirt will damage the front of the eye causing corneal ulcers. The infection involved can penetrate through the front of the eye in 24–48 hours, allowing infection to enter the eye itself resulting in the loss of the eye. Treatment involves antibiotic eye ointment and hooding the eye to protect it from sunlight, dust and flies. Seek veterinary advice.

Feeding problems

At times during the year, northern pastures barely provide enough nourishment for maintenance. When horses are worked with this type of pasture as the sole source of energy, body reserves are called on resulting in rapid weight loss and eventual weakness. To avoid this situation, the working horse's diet should be supplemented with high-energy food when in work.

Provided there is adequate pasture or hay available as a maintenance supply, grain can be safely fed in small quantities. However, horses should be fed individually to avoid dominant horses gorging and less dominant horses not getting sufficient nourishment. Gorging can result in digestive problems and, at worst, laminitis.

When working out a grain ration, it is useful to bear in mind that the daily grain allocation for horses of the Light Horse Brigade when working in the desert was eight pounds of barley. Commercial mixes are available that supply energy, protein and balanced vitamins, minerals and electrolytes.

Monday morning disease (azoturia, paralytic myoglobinuria)

This condition occurs soon after a horse in full work and feed starts work following a day or two off on full-grain ration. The overfeeding while not working overenergises the muscles. With the start of work, there is a massive breakdown of this energy which damages the muscles.

The horse is lame and usually will not move. The muscles mainly of the rump and hind legs are hard, swollen and painful to touch. The intense pain causes the horse to sweat profusely. If urine is passed, it will be stained dark brown to red with the breakdown of muscle tissue. No attempts should be made to move the horse until veterinary treatment is initiated.

This condition can be prevented by not keeping the horse in full feed unless a full day's work is anticipated. Excess grain is the major cause of the problem.

Muscle tying-up is a less severe form of this condition. The muscles of the rump and at the back of the hind leg become hard, cramped and painful but the urine is normal: that is, there is no muscle breakdown. The tie-up usually occurs 3–4 hours after the horse has been worked. If spelled, the horse returns to normal in 2–3 days.

Treatment involves rest, with a gradual return to an exercise programme; electrolytes; and anti-inflammatory drugs. Vitamins may also be useful. Feed will have to be cut down as the horse is getting too much grain for the amount of work being done.

Big head (*Osteodystrophia fibrosa*)

This condition is caused by a calcium deficiency in the diet of the horse. Unfortunately the name “big head” is not a good one because head swellings do not occur in all cases of the condition. The disease may occur when horses are fed high-grain rations for prolonged periods. In grazing horses it has occurred when they feed on certain introduced tropical grasses. These are buffel, green panic, setaria, kikuyu, guinea, purple pigeon, para, pangola and signal grasses.

Clinical signs

- Loss of performance and tiredness — progresses to stiffness with a shortened gait.
- Ill-thrift — loss of condition occurs on pastures that appear nutritious and support cattle without difficulty. Progression to emaciation and death may occur.
- Lameness — initially only associated with exercise, horses may stumble more frequently than normal or have difficulty in rising after resting. Gait abnormalities may lead to dumped toes.
- Swollen jaws — the swellings are even on both sides of the head over the areas of the tooth roots and over the bones of the nose.

Cause

For good health the ratio of calcium to phosphorus in the diet should be approximately 2:1. Consequently, the feeding of high-grain rations which are not supplemented with extra calcium may lead to deficiency. With the above grasses the problem is not a deficiency of calcium in the plant but the presence of oxalate crystals which prevent the horse from absorbing the calcium during digestion. Ruminants are able to overcome this problem because their rumenal bacteria break the oxalate down and the calcium is released to the animal.

If the animal obtains insufficient calcium over a period, calcium and phosphorus are withdrawn from the bones and replaced by fibrous tissue — hence the lumpy appearance. Bones and joints which contain inadequate levels of calcium and phosphorus become weakened and painful, resulting in lameness and loss of condition.

Control and treatment

In most cases, if animals are returned to a diet containing the correct proportions of available calcium and phosphorus, the disease can be reversed, apart from some minor permanent swelling. Feeding programs which have been used are:

- Restrict horses to native pastures or non-hazardous introduced grasses such as rhodes, couch grasses and paspalum.
- Introduce a legume component to the pasture as most legumes are high in calcium and low in oxalate.
- Provide a mineral supplement. If horses are being fed daily use 60 g per day of dicalcium phosphate (DCP) which is relatively cheap and readily available.

Station dog health

Dan Hogarth, District Inspector of Stock, Mareeba

Station dogs, when used on the property, are a real asset to the grazing enterprise. They offer great returns for low input, and should be cared for and protected to the best possible extent to guard against disease, injury and accidental poisonings.

Nutrition

There is a variety of feed types suitable to make up the working dog's ration. Raw meat is the natural food for a dog but it should be supplemented with a balanced dry food or a broth of lightly cooked, crushed cereals and vegetable scraps to correct nutritional deficiencies. Contrary to many beliefs it is unlikely that dogs will contract any debilitating disease or worms if fed uncooked meats. However, if the dog is allowed the offal of sheep or kangaroos, there is the risk of spreading the hydatid tapeworm which affects humans.

Kangaroo meat is a low-fat meat, and ideal as a maintenance ration. The addition of mutton or beef to the diet provides greater energy and will fatten dogs and add gloss to their coats, due to its higher fat content. Dry dog food can be fed as a supplement or as an entire meal, and is a low-cost alternative.

Internal parasites

Heartworm

Spread by mosquitoes, this is the most important parasite affecting dogs in the north. Infestation can occur early in the dog's life and go unnoticed until the disease is in an advanced stage. The earliest signs of heartworm disease may be a slight cough after exercise, a tendency to tire, and a loss of condition. Progression of the disease then leads to chronic coughing with bloodstained phlegm, laboured breathing, lack of stamina, a distended abdomen caused by accumulation of fluid, and can result in death.

Prevention of infestation is the best control, which can be given through

a regular monthly tablet available through veterinarians. Heartworm can be treated. However, successful therapy depends on early detection and prompt treatment, and close veterinary supervision.

Hookworms

Intestinal worms are another concern of working dogs in the north. Although other worms may occur frequently, hookworms are a particular threat with heavy burdens resulting in anaemia, lethargy and death. Dogs under two years of age have the highest prevalence, as do those confined in runs with dirt floors. Cementing floors, raising the kennels and removal of droppings will virtually eliminate the problem. A range of “wormers” are readily available for the treatment of internal parasites such as hookworm, roundworm, whipworm and tapeworm.

External parasites

The brown dog tick (*rhhipicephalus sanguineus*), no relation to the cattle tick (*boophilus microplus*) is a common parasite to dogs in the north. Feeding on blood and lymph fluid of the animal, an infestation can cause anaemia, irritation and reduced vitality.

Chemical treatment of dogs and kennels, cement floors or raised housing are successful methods for control. Barricade S is the only cattle dip registered for use on dogs. The use of other cattle dips is not recommended.

Fleas are also a potential problem for dogs, causing irritation and worry and, in some cases, allergies resulting in hair loss and sores. Fleas should be treated in a similar manner to ticks.

Viral diseases

Canine distemper, canine parvovirus and canine hepatitis are spread by direct contact and can survive in the environment if the conditions are right, but a 3-in-1 vaccine can be used for protection against them. Pups should be inoculated at least twice, once at 6–8 weeks of age and again at 16 weeks. Adult dogs should be revaccinated annually. Unvaccinated dogs are at risk, and treatment of these diseases is difficult, expensive and often unsuccessful.

Station pig care

Glen Sibson, District Inspector of Stock, South Johnstone

The station pig is often a feral pig or a descendant of one. This type of pig has developed its characteristics through natural selection for survival. Its lean meat production ability was lost generations ago. Therefore, you are wasting your time and money feeding feral pigs. Any weight that they do put on is usually fat. The commercial-type domestic pig has been bred to produce the most lean meat from the least feed input. So do yourself a favour and start with the best animal.

Housing

The pig sty should be sited on a well-drained area downwind from the homestead. Although pigs are considered dirty animals, they do perform better in a clean environment. Ideally, a concrete floor would provide the best surface for housing pigs. However, dirt floor pens, providing they are kept clean and well drained, are adequate. A slab of concrete around the feeding area is most desirable in this instance.

Shade is essential. Pigs are easily stressed by heat and are also prone to sunburn. Pigs of different sizes should be run separately to avoid bullying. Piglets require enclosures with restricted access to sows and older pigs, as crushing is a common cause of piglet mortality.

Water should not be allowed to accumulate in the pens as this facilitates the hatching and survival of worm parasites and the survival of harmful bacteria. Wallows may look good in hot weather, but can become foul sources of infectious diseases such as leptospirosis and melioidosis.

Feed and water

Proprietary feed mixes are the best options as they contain all the necessary protein, energy, vitamins and minerals in the correct proportions. If grain is available on the property, it will need to be mixed with an extra protein source as grains do not have all the essential amino acids (protein building blocks) required for pig growth. A vitamin/mineral premix is also required.

Young pigs need to have fresh food available to them all the time. Depending on the age at weaning, you may need to feed them a “creep” diet until about five weeks old, and then a weaner diet to about nine weeks (approx. 20 kg liveweight). After that, feed a “grower” diet until 13–14 weeks (40–45 kg). Most pigs can be given unlimited access to food up to this age or weight. During the pig’s finishing phase, the feed intake may need to be restricted (2–2.5 kg finisher diet feed/day).

A plentiful supply of clean water should be available at all times, particularly if dry feed is being given or hot conditions are experienced. Bore water containing a high level of salt (NaCl) should be avoided. Pigs are particularly susceptible to salt poisoning, more so than other species. Poisoning may occur, especially if water intake is restricted. Swill feeding is *prohibited by law*. Food scraps (swill) containing animal matter from any source such as cafes, hospitals and even normal domestic households *must not be fed to pigs*. This ban on swill feeding was brought about due to the extreme risk of introducing an exotic disease to our livestock. The vast majority of foot and mouth disease outbreaks recorded overseas have resulted from swill feeding pigs.

Legal requirements

Under the Brands Act, pigs offered for sale or slaughter are required to be tattoo branded except when the owner has no more than two pigs or the pigs weigh less than 30 kg liveweight. Tattoo brands will establish legal ownership of pig carcasses and show their origin for disease control purposes. The tattoo brands are registered with the Department of Primary Industries and consist of the number “4” followed by three letters. A branding tool capable of holding the characters and a suitable carbon-based marking ink or paste is all that is required to administer the tattoo.

Parasites and diseases

Another good argument for not keeping feral pigs is the disease risk. The most threatening diseases to humans from wild pigs are brucellosis, leptospirosis, melioidosis and sparganosis. Pig hunting, slaughtering, handling and eating feral pigs are the main means of becoming infected with these diseases.

Vaccination against erysipelas and leptospirosis in domestic pigs is generally all that is required for disease control. The recommended program is twice-yearly vaccination after two initial vaccinations 4–6 weeks apart.

Scouring can be a common problem with piglets and weaners. Oral dosing with antibiotic preparations will control most cases. If the scour contains blood, more intense treatment may be required.

Parasites, both internal and external, may cause problems in the station pig. Sarcoptic mange can be suspected when a skin disorder is noticed and affected pigs are scratching. The treatment involves thorough spraying with an approved chemical, with particular attention being paid to the ears and between the legs. Mange is caused by mites burrowing into the skin.

Worm parasites reduce growth rates and cause ill-thrift. Large round worms and kidney worms are the most common. Control is achieved with good hygiene and by timely use of worming medication. Dung should be removed from pens at least daily. Worm treatments are always required at weaning and 3–4 weeks later. Regular treatment of the breeding stock leads to a lower level of infestation being available to young stock. Treatments are given in the form of a feed additive.

General information on pigs

Normal body temperature	39.3°C
No. of piglets per litter	9
Possible no. of litters per year	2.2
Gestation period	16 weeks
Farrowing interval	165 days
Puberty age	4–5 months
Weaning age	30 days
Usual slaughter weight:	
Baconer	75–120 kg liveweight 50–85 kg dressweight
Porker	45–75 kg liveweight 30–50 kg dressweight

Zoonoses

Lyle Torenbeek, District Inspector of Stock, Bowen

Zoonoses is the term used to describe diseases that may be transmitted from animals to humans. The five diseases detailed below are only a few of the more important zoonoses pertaining to stockmen.

Table 18 Zoonoses relevant to stockmen

Disease	Cause	Habitat	Method of infection	Symptoms	Treatment and prevention
Salmonella	<i>Salmonella</i> group of bacteria	Intestines of man, animals, birds	Ingestion of faeces, or of contaminated food or water	Fever, depression, anorexia, dehydration, weakness, nausea, hurried breathing, diarrhoea/vomiting, and death	Antibiotics Stringent hygiene
Q-Fever	<i>Coxiella burnetii</i>	Afterbirth, faeces, urine, milk	Breathing air and dust, usually at abattoirs, woolsheds, cattleyards	Occur suddenly. High fever, chills, sweating, severe headaches, muscular spasms, mild dry cough. Less than 1% of affected people die.	Vaccine Antibiotics Hygiene to prevent contamination.
Lepto-spirosis	<i>Leptospira</i> group of bacteria	Pigs, cattle, dogs, rats	Infected urine through skin, mouth, nose, eyes. Usually dairy, pigs, cane farms, abattoirs	Aching muscles, chills, high temperatures, nausea, vomiting, anorexia. May cause abortions.	Hygienic husbandry practices. Boil dam and creek water. Avoid eating feral pigs. Use waterproof footwear.

(continued)

Disease	Cause	Habitat	Method of infection	Symptoms	Treatment and prevention
Hydatid	Larval <i>Echino-coccus granulosus</i> (dog hydatid worm)	Dogs and dingoes	Ingestion of ripe segments of tape worm that have contaminated dogs' coats or vegetable gardens	Cysts in liver, lungs, brain, kidney, bones. Interrupt normal organ activity and require surgery.	Regular drenching of dogs. Don't feed sheep offal. Good hygiene, especially after handling dogs.
Sparganosis	<i>Spirometra erinacei</i> (pig tape worm)	Pigs (domestic and feral)	Ingestion of first-stage larvae in: – insects from water – raw or not completely cooked tissue of fish, rabbits, pigs.	Produces sparganum, another stage in life cycle of tape worm. Irritation and pain.	Treatment by surgery and/or medical treatment. Avoid drinking "raw" water: filter, boil or chemically treat. Cook pork thoroughly before consumption.

Marketing



Market presentation of cattle

Dan Hogarth, District Inspector of Stock, Mareeba

Market presentation of cattle is not a new concept. It is one of good management aiming to:

- produce cattle suited to particular markets;
- present cattle for sale to maximise return;
- choose the market option most suitable for the particular line of cattle.

Good market presentation involves attention to the welfare of stock and to other “value adding” aspects such as branding, dehorning, tail tagging, the correct use of chemicals on stock, and understanding obligations as to formal paperwork involved in marketing cattle.

Importance of presentation

Maximising production and financial returns from stock requires attention to their welfare. Good husbandry is necessary — ensuring that you meet the physical needs of animals, such as adequate food, water, and minimisation of disease and stress. Husbandry practices which influence presentation for sale begin at birth and end at the point of sale. A number of factors are important to good presentation.

Condition

The condition of stock relies on:

- effective use of pastures
- a good-quality herd
- optimum herd health.

Cattle in good condition are easier to sell. Good feed and water in holding paddocks help maintain condition during mustering and handling.

Branding and dehorning

Brands signify ownership but do not have any direct effect on the value of cattle. They are, however, the label of the producer or property, and contribute to the presentation of sale cattle. Brands should be legible and neat. Good branding requires ensuring branding irons are in good order, hot enough and applied properly.

Branding devalues hides, particularly when applied to the rib position. For this reason it is intended that the rib position be removed as an approved position in future brands legislation. The use of symbol brands and minimum-sized brands will help to restrict hide damage. Hides are also damaged by external parasites, whip marks and barbed wire scratches. Producers who minimise hide damage may be rewarded when hide payment systems are introduced.

Horned cattle are a major cause of hide damage but, more importantly, they cause bruising. Over half the bruising in mobs of horned cattle can be attributed to horns. Complete dehorning is required as tipping does not reduce the level of bruising. Dehorned cattle are easier and safer to handle, are cheaper to transport, and require less trough space in feed lots. Dehorned cattle present a more even line and always attract greater buyer interest.

Weaner education

Well-handled cattle are easier to manage, and a breeder's reputation for quiet, manageable cattle fosters buyer loyalty and repeat purchases. Well-handled cattle travel better, and are less likely to be stressed at saleyards or abattoirs. Restless cattle do not settle in paddocks or feedlots, thus decreasing liveweight gain. They are also more prone to bruising.

Handling and transport

Good handling requires not only good weaner education, but trained and competent staff and well-designed facilities which minimise bruising, injury and stress. Good handling of cattle is also necessary at saleyards, trucking yards and abattoirs.

Optimising weight and quality

As most cattle are sold on the basis of liveweight or carcase weight,



Well-managed stock grazing on improved pastures in North Queensland. A breeder's reputation for quiet, manageable cattle fosters buyer loyalty and repeat purchases.

it is important to minimise losses in liveweight, carcass weight and also quality.

Liveweight loss

An animal's liveweight includes gut fill and bladder contents. It is normal for cattle to be fasted to give a more uniform liveweight for marketing purposes — hence “curfews” at saleyards etc. Gut fill and bladder contents commonly comprise 10% of total liveweight.

This loss is common in the first 12 hours “off feed”. To avoid additional loss, feed and water should be on hand. Even though actual time in transit cannot be avoided, cattlemen should minimise total time between mustering and sale.

Cattle should be removed from feed and water and rested 6–12 hours prior to trucking. This avoids slippery decks, and subsequent bruising and stress if cattle go down.

Carcase weight loss

When cattle are deprived of food and water for two or more days before slaughter, carcase weight loss occurs due to dehydration and tissue breakdown. The provision of water alone will decrease the amount of weight loss. Feeding and watering during handling, transport and spelling will further reduce these losses.

Carcase quality

Carcase quality is becoming increasingly important in determining the returns cattle producers receive. Bruising can be avoided by dehorning, weaner education, good facilities, and careful handling and transportation.

Dark cutting meat is a problem caused by a rundown of energy levels in the body. Provision of feed and water during spelling and minimising time between muster and slaughter help. If cattle are not allowed to rest prior to slaughter, stressed animals will have dark cutting beef. This highlights the importance of weaner education, good facilities and careful handling.

Field days and workshops. Best practice is the key to maximising quality and financial returns.



Documentation and paperwork

Increasingly, buyers of cattle are requiring certain declarations of “assured quality” from cattle producers. Vendor declarations outlining the usage or non-usage of chemicals on cattle for parasite control, hormone growth promotants or any specific substances should be supplied correctly and in the form required by the vendor. Increasingly, these declarations may have legal obligations. Therefore, it is imperative that all information supplied is correct.

Quality assurance programs

Quality assurance programs have been developed for the beef industry. There are currently two on-farm beef quality programs available to cattle producers: Q CARE and CATTLECARE.

The Q CARE program has been developed by the Cattlemen’s Union of Australia and the United Graziers’ Association of Queensland. Commenced in late 1995, the program is based on the CATTLECARE quality assurance program but focuses solely on the management of agricultural chemicals and veterinary drugs.

The CATTLECARE quality assurance program has been developed by the Cattle Council of Australia. It is a quality assurance program which conforms to the internationally accepted standards of ISO 9002 and Hazard Analysis Critical Control Point (HACCP) principles. CATTLECARE addresses chemical residues, bruising, hide damage and stock transportation.

Both of these programs address market presentation and quality control at the producer level. They are committed to the production of a uniform-quality article and are quickly becoming industry norms. Less and less, quality control is being performed by regulatory inspection techniques. Previous regulatory control relied on removing the offensive article rather than employing sound production systems which will be rewarded by increased consumer confidence and likely better prices. Information about these programs can be obtained from producer organisations such as the Cattlemen’s Union or the United Graziers’ Association.

Livestock movement controls

Livestock movement controls have been eased with the introduction of the Move Easy Livestock Movement System, and it is easier for producers to move cattle. However, producers must be aware of their obligations to complete the necessary paperwork correctly. This kind of attention to detail promotes good business relations. Like the image evoked by a line of well-presented, dehorned, clearly branded cattle, it fosters good marketing presentation and, hopefully, a premium price at the marketplace.

Conclusion

Responsibility for presentation of live animals ends at the point of sale. Because of the potential liveweight and carcase losses which can occur during handling, transport and marketing, cattlemen should adopt strategies which will reduce these losses. For store producers this will become increasingly important as more store cattle are sold on a liveweight basis.

To optimise returns, prime cattle producers have to meet market requirements which are becoming increasingly specific. Careful presentation, good management and marketing are an integral part of meeting these requirements.

Live cattle export trade

Rick Dunn, Senior Inspector, Live animal exports (Health), Townsville

The live export trade has been in operation for the last thirty years or so, beginning with opportunistic, one-off live shipments through to today's shipments of hundreds of thousands of cattle annually. However, the industry has gained momentum in the last five years for a number of reasons:

- (1) South-East Asian countries are becoming more westernised, and there is an emerging middle class of Asians with higher disposable incomes who are developing a taste of beef.
- (2) Traditionally, pork and poultry was the basis of their staple diet but they are now looking for other cheap sources of protein.
- (3) Asian livestock numbers are dwindling as a result of this increase in demand. Australia is the only country in close proximity to South-East Asia that can supply quality grass-fed cattle in numbers.

Cattle being mustered for sale to the growing live export market.



Feeder steers

Brahman X feeder steers make up the bulk of all live exports. These go to feedlots and are fed on local rations such as pineapple pulp, palm kernel cake, cane tops, mill by-products or brewers grain, or a mixture of these. They are normally fed for about 8–10 weeks before slaughter.

Preference is shown for steers of around 270–310 kg liveweight for the Philippines and heavier steers (350 kg liveweight) for Indonesia. Liveweight gains are normally around 0.8 kg–1.5 kg per day in the feedlot.

Slaughter steers

Smaller countries such as Brunei import mainly slaughter steers of around 380–430 kg liveweight and buffalo. An average boat trip lasts about 4–7 days and stock are fed a ration consisting of compressed lucerne called Hycube or a mixed ration in pellet form. Stock generally gain weight of up to 0.7 kg per day during the trip.

Breeding cattle

Most breeding stock in the past few years has been destined for the Philippines and Indonesia. There has been much speculation whether exporting breeding cattle will eventually lead to competition with Australia and self-sufficiency of these nations. However, it is unlikely this will occur for two reasons:

- (1) South-East Asia is becoming more mechanised and farming techniques have improved, so farmers are cropping more land. Rice is a major export earner.
- (2) There is neither the land area nor the capacity to increase breeding herds substantially to maintain beef supply to an ever-increasing population. At best it would be only supplemental, so imports are likely to stay constant to keep up with demand.

Overall, countries importing both feeder and/or slaughter stock require at least 50% Brahman content, and breeders 7/8 Brahman or pure Brahman. Due to increasing demand and shortage of steers in some instances, spayed heifers and heifers which are pregnancy-tested empty are also gaining acceptance for feedlotting.

Droughtmaster, Santa Gertrudis, Belmont Red/Brahman Cross, Charbray and Simbrah breeds are also being sought as the demand for cattle increases, especially given their suitability to South-East Asia’s tropical climate which is similar to that of northern Australia.

Live export development

Live exports from Australia are currently valued at in excess of \$344 million annually (1996 figures). At present, there is a great demand for cattle for live export to meet South-East Asia’s growing needs, and this demand is expected to continue. Table 19 shows the enormous development which has taken place since 1986.

Table 19 Exports of live cattle

1986	1991	1993	1994	1995	1996
78,000	98,000	150,000	240,000	509,636	723,000

The Australian Livestock Exporters Association (ALEA) recognises that Queensland has a major role in supplying the required cattle consistently year round. Queensland cattle made up about 61% of the total exports through Darwin to South-East Asia in 1996. Darwin is recognised as the major port for live exports, due to its close proximity to Asia. However, there are a number of other important loadports.

Foremost is Karumba in the Gulf of Carpentaria where a Queensland company, Austral Livex, has constructed a yard facility, wharf and weighing scales to cater for the growing live export trade. Producers in North and Central Queensland and Cape York Peninsula will gain most benefit from this development, and 51,000 head of cattle were exported through Karumba in 1996.

Four other outlets in Queensland are also becoming significant loadports for live exports. Figures for 1996 were: Townsville (62,000), Brisbane (14,000), Mourilyan (5000) and Weipa (700).

It is clear that North Queensland has a bright future for providing suitable cattle for this trade. Producers now have another marketing alternative as well as the traditional store markets in the south.

Premium prices for northern cattle

Tony Kellerman, Elanco Animal Health

Four major markets are available to northern cattle producers:

- (1) Store cattle market: feedlots; fattening by other producers
- (2) Prime cattle market: export and domestic meatworks
- (3) Live export steer trade to Asian countries
- (4) Manufacturing meat market.

Primarily, male cattle are used to produce beef in northern Australia. Female cattle are now also being considered, due mainly to increased productivity on properties. This has come about by changing from British-type breeds to a dominant Brahman-type breed, along with better management and paddock supplementation in our drier northern winters. This in turn has put further pressure on pastures and stocking rates, allowing less time for paddocks to recover from our long run of droughts.

To produce the necessary carcass requirements for our ever-changing prime cattle markets and the required liveweight for live export cattle, northern cattlemen must hope for very favourable seasons. Unfortunately, we all know that our seasons are totally unpredictable. As a result, in order to get the best returns for the property enterprise, a producer has trouble in identifying what market to target in the coming season — whether to produce cattle for live export, for stores, or to finish to Jap Ox specifications.

If we look at each market individually, we can get an idea as to their particular requirements, and what the producer has to do to target that market.

Boxed beef: export and domestic

Australia's markets for boxed export beef are becoming more specialised, with specific carcass grades or specifications being requested by the meat

processors. Age or the number of teeth, along with “meat colour, marbling score, fat colour and cover” have become the major influencing factors in carcase quality standards.

Significant price differentials between the age groups now apply for the premium boxed beef markets of North Asia. Whether we like it or not, our boxed beef export markets are demanding younger and younger animals as is our domestic market. Yet the demand is still at weights that are normally associated with older cattle.

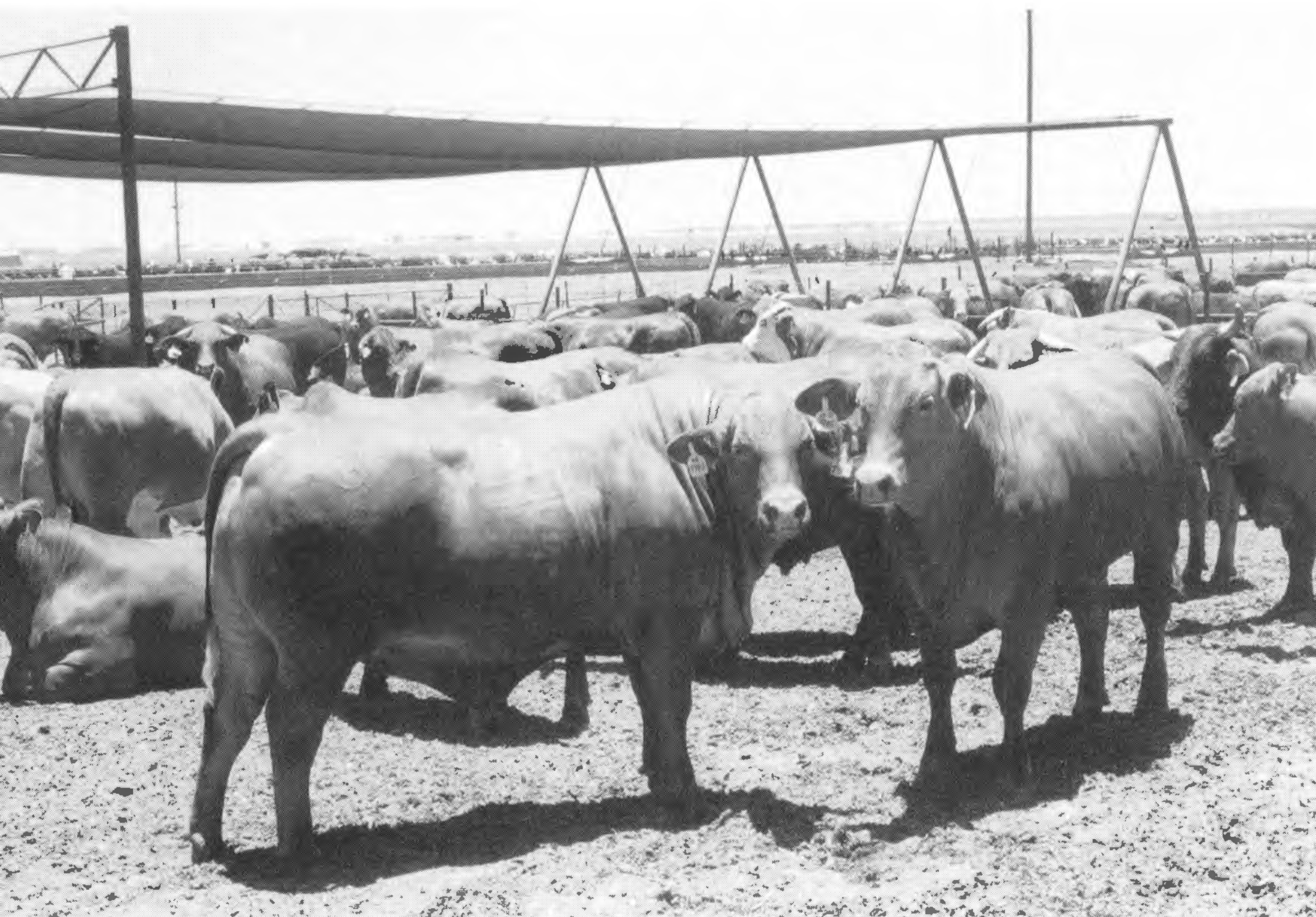
Producers who are targeting these markets have an option to either produce cattle for them or for the United States manufacturing grade market. Many producers, because of their country and environment, can only produce manufacturing-grade beef, which can be most profitable because of the lower cost inputs.

Those producers who produce cattle for the southern store market will have to turn off their cattle at an age that will enable “fattening” producers to turn those same cattle off at a maximum 6-tooth/3-year-old, at the required weight to attract premium prices. This means that a store producer must turn off an animal that is less than two years old and weighing about 400 kg — not an easy task with our variable seasons.

Live export cattle

Northern cattlemen over the last two to three years have been able to target the live cattle export trade of our near Asian neighbours. The live cattle export market in South-East Asia offers our northern cattlemen an ideal opportunity to target a market that requires an animal that has a large amount of *Bos indicus* infusion. As our northern cattle are predominantly a high-grade Brahman herd, they are ideal for the hot and humid conditions of Malaysia, Brunei, Thailand, Indonesia and the Philippines. Over the last couple of years the cattle prices have been better for this market than for the Jap Ox market.

The live export specifications do vary from exporter to exporter and country to country. However, all importers are looking for younger cattle, and stricter specifications are now being demanded by the exporters. That is, the specifications have narrowed: 18–24 months old; and 400–450 kg liveweight.



Improved pastures and feedlotting ensure cattle will achieve the premium specifications required for particular markets in a shorter period of time.

The question is: how do we get an animal to these weights in our northern seasons? There are a number of ways to ensure that cattle are finished within the required time frame and some of these include the following: feedlots, improved pastures, supplementary feeding and hormone growth promotants (HGP's).

Feedlots

Feedlotting is one way to guarantee the finishing of cattle, or to get the cattle up to the required specification. However, in present conditions the grain-producing areas are too far away to economically turn cattle off in any large numbers. Freight costs of transporting grain have to be added to any feedlotting costs.

Improved pastures

This is another avenue available to producers that are close to a river system, and should be seriously considered. Pastures of tropical grasses, lucerne or other leguminous species can be planted quite easily. This is already being done by a number of cattlemen who are on river systems.

Supplementary feeding

North Queensland cattlemen have been fortunate to have a number of highly experienced Department of Primary Industries personnel involved in drought feeding. “Swans Lagoon” Research Station has put out a number of publications associated with M8U mixes, which clearly show that cattle can be fattened on them.

Supplementary feeding should be considered regardless of the season, and become part of the property management. This not only applies to finishing stock. Feeding weaners is one way to ensure that the steers will not go backwards but put on the weight gains required to reach those premium specifications. When feeding supplements, both a protein meal and a rumen modifier (ionophore) like Rumensin should be included to maximise the benefit from the supplement and available pasture.

Hormonal growth promotants (HGPs)

One of the best and most economical management tools available to every beef producer is a hormonal growth promotant (HGP). It is also another way to assist in combating the uncertainty of the seasons and assist in turning cattle off at a younger age. Significant weight gains can be achieved whether cattle are turned off native pastures, improved pastures or feedlots.

What are HGPs?

There are a lot of myths and misunderstanding associated with hormone growth promotants. What should be understood is that the products registered for use in Australia are safe and have been tested for many years by the United States Food and Drug Administration. The Department of Primary Industries closely monitors all food additives, pharmaceuticals and other products that are used in animal production.

Types of HGPs

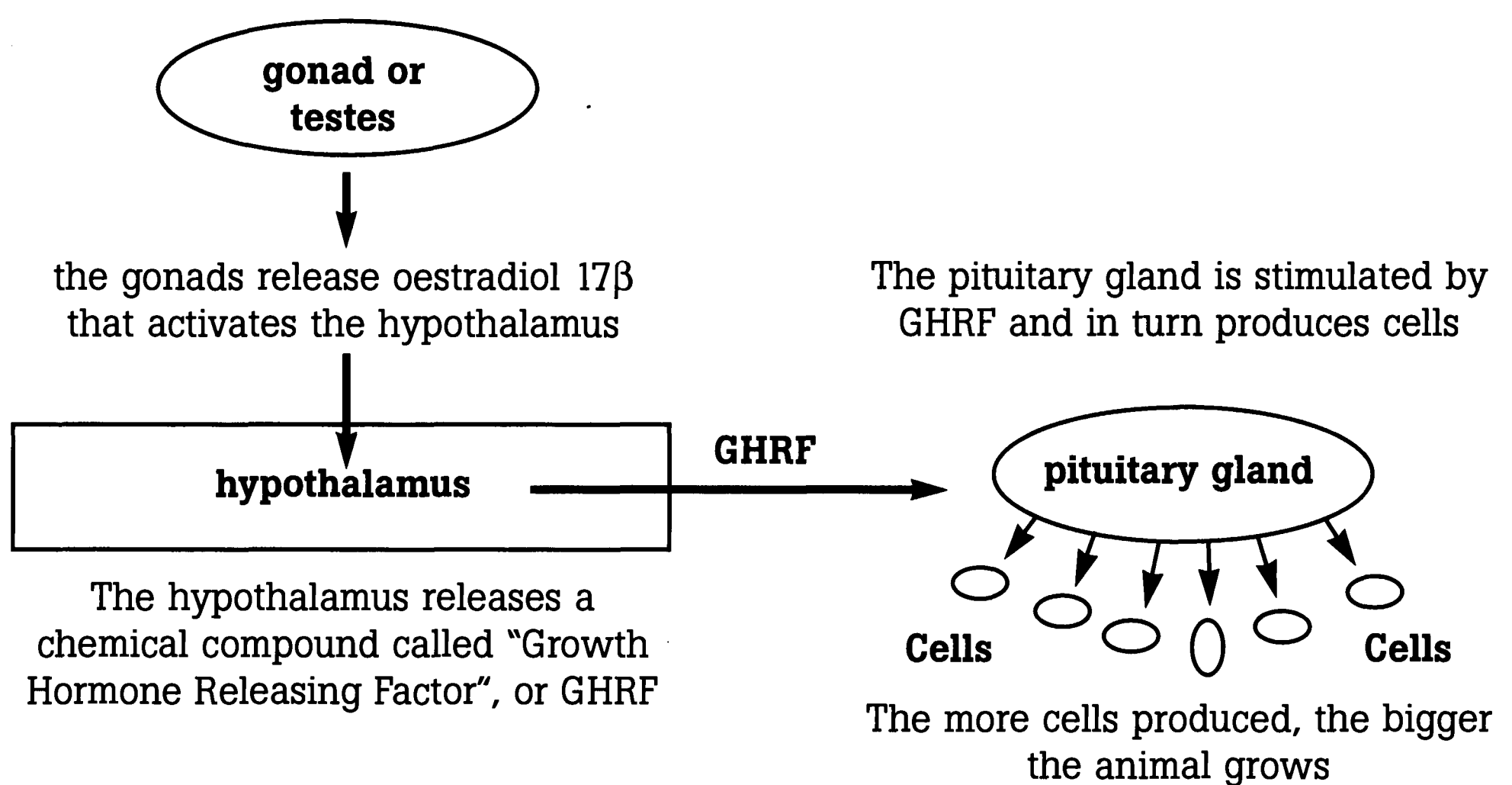
There are basically two types of HGPs available on the market: *naturally occurring* compounds such as Compudose, Component, Synovex and Steerex, and *synthetic compounds* such as Ralgro and Revalor.

The synthetic compounds mimic the action of naturally occurring hormones. Scientific evidence and trial work completed in the United States, United Kingdom, Canada and Australia have shown that the use of these hormones in food-producing animals, specifically cattle, is safe from a human standpoint and gives the producer greater returns on his investment.

The growth pathway

One of the first things we do to our new calves once they are mustered is “brand” them. During this process, the calves are castrated, dehorned, branded and vaccinated. (Many producers also use a long-acting implant at this stage.) However, by castrating the male we remove the animal’s full potential for future growth.

All male mammals need two primary hormones for growth: oestrogen, a female hormone, and testosterone, the male hormone. It is the oestrogen or, more specifically, oestradiol 17β that is responsible for a male mammal’s growth or production of cells for growth. There are a number of pathways for growth but the single most important one is the oestrogen pathway. The following diagram illustrates the endocrinology of growth.



The steer calf will grow after being castrated. However, as he is not getting his full amount of oestradiol 17 β to send a message to the hypothalamus, he will not grow to his full potential — that is, a bull compared to a steer.

Hormone growth promotants act as the stimulant to release a message to the hypothalamus to release the GHRF needed by the pituitary gland to produce cells. As a naturally occurring hormone, the animal's system identifies it as such and breaks it down in its normal process.

One can therefore see the rationale for implanting (preferably with a long-acting product) an HGP at “branding time” to maximise the animal's full potential for growth. The only thing which is then needed is food.

Export competition

Australia treats around 15% of the national cattle herd with HGPs, with a higher proportion in Queensland. However, when one looks at the difference between the numbers treated in the United States (95%) and Australia, one cannot help but wonder how many millions of dollars are being missed by the producer, the various meatworks, and Australia as a whole.

The United States is Australia's major beef exporting competitor for our premium-priced Asian markets, closely followed by New Zealand. As mentioned already, in excess of 95% of US cattle are treated with one of the various HGPs available on the market.

The producers of those enterprises that are producing beef for export are at a distinct cost advantage over Australian producers. In fact, Texas A&M University has stated that implants represent a return of approximately US \$100.00 per carcase. Based on the US current cattle numbers, that amounts to US \$4.1 billion, a very substantial figure.

Economic benefits of HGPs

Northern cattle producers should seriously consider the use of HGPs to remain economically viable. Pressure to keep income coming in at a rate to keep up with costs is becoming very apparent. Landcare issues, herd improvement costs, general property maintenance increases, general running costs, wages etc. all have a direct bearing on the returns of a property.

Landcare

One of the best ways to rest or spell paddocks is to reduce stock numbers on those particular areas that have been over-used or “flogged”, particularly in our drier times.

An obvious answer to help in increasing the annual return while still keeping cattle numbers at the desired level is to use an HGP. With an average weight gain of 32 kg (average for a long-term HGP), their use must be seriously considered to achieve the goals of fewer cattle and paddock caring/spelling.

Meeting market specifications

HGPs can be used strategically to utilise the grass growth on a particular property. Because of our drier seasons, more and more cattlemen are using supplements in their paddocks to utilise whatever feed is available. If cattlemen are feeding supplements, they could also implant with an HGP to suit their feeding regime. This would maximise the potential of the animal to convert more feed to put on more weight and finish sooner.

If cattlemen are able to hold or even increase weight gains during the dry periods, they could greatly improve their chances of producing cattle that can reach the premium specifications and prices being offered, or of onselling their cattle so that other producers can turn those same cattle off for a premium price.

Conclusions about HGPs

HGPs are a valuable management tool to help cattlemen finish their cattle to meet premium specifications. HGPs can also assist in reducing cattle numbers in times of drought as well as in normal times, and mean that the cattleman can have more pasture for use or spelling. Experience shows they can reduce the age of turnoff cattle, and definitely increase the potential dollar returns to the individual property.

Care of saddles and bridles

Allan Childs, District Inspector of Stock, Mackay

Although leather has been around for thousands of years, modern technology has yet to produce a synthetic to successfully replace it. Leather is still the best product for saddles and bridles and will last for a very long time if properly cared for. It does, however, require a little attention to get the best service from it.

The Australian stock saddle is good value for money. Consider that a top brand, hand finished, made-to-order saddle can be bought for the equivalent of five weeks of a ringer's pay. This same saddle, with proper care and attention, can last most of the person's working life. Thirty years ago the factor was about ten weeks' pay.

The real value in an Australian stock saddle is that it can be repaired many times over. Providing the tree is sound and the basic leather components remain strong enough to accept stitches, it can be returned to near-new condition for a fraction of the cost of a new one. The secret lies in regular care and attention.

Counterlining

An Australian stock saddle is lined with doe hair which is actually the hair scraped off cattle hides during the tanning process. This doe hair soon settles down and moulds itself to the inner parts of the saddle and becomes flat and very hard. This is the time when the saddle should be returned to the saddler to be counterlined.

Counterlining involves adding softer, more springy, curled hair. The hair used in counterlining is usually from the tails of cattle. It is washed and twisted up much like a rope to give it a permanent curl. The saddler teases this out to provide a softer cushion which is in the shape of the horse's back. Counterlining can be done many times during the life of a saddle.

Basic care

Saddles should be stored out of the weather, preferably in the riding position on suitably constructed racks. These racks can be anything from wooden pegs driven into the shed posts to elaborate steel constructions. Sometimes, however, especially if mice are a problem, it may be advisable to hang them by the crupper bar on wire hooks from the rafters of the shed.

Borers and also the larvae of certain moths can attack stored saddles. To avoid this type of damage, the saddle shed should receive a pest control treatment whenever other property buildings are done. These pests do not attack saddles that are regularly used.

Many saddles are damaged through careless use. A saddle placed against a wheel is in danger of being forgotten and run over when the vehicle is moved. Sometimes carelessly placed saddles are walked on by restive horses. Or they may be rolled on if the rider is too lazy to remove the saddle at smoko time. Just remember the five weeks' pay it takes to replace it!

Cleaning and greasing

The worst enemies of leather are excessive heat, salt and mineral oils. *Never use engine oil on any leather.* Leather should be cleaned before being greased. Mild, soapy, lukewarm water is recommended to scrub the dirt and sweat out of saddle flaps and other grubby gear. The same applies to bridle straps.

Allow the leather to dry naturally in the shade, and then give a liberal coating of an animal-fat-based leather dressing. Some very good proprietary brands are available or you can make your own.

Leather dressing recipe

This allows you to make your own leather dressing using fresh animal fat. Mutton fat is good, but pig or beef fat may also be used. Be sure there is no salt in it. Render the fat down, add a little bees wax, and thin with vegetable oil. Any unused cooking oil is suitable. Experiment with the vegetable oil to get the right consistency. It needs to be soft enough for use even on a cool day.

Share the wear

Stirrup leathers should be removed from the saddle and bridles pulled apart for greasing. All stitching should be inspected for signs of wear and damage and repaired at this stage. Learn simple stitching using two harness needles and waxed thread. Thread can be bought already waxed.

Do not attempt to strengthen stitching by putting rivets through the joins. This practice gives a false sense of security as the metal rivet reacts with the leather causing a weak spot.

Stirrup leathers should swap sides occasionally to even out any stretch. Near-side leathers can stretch more than off-side ones because of the extra weight when mounting. The wear point where the leather hangs on the stirrup bar needs to be changed to even out the wear. The same applies to wear points on a bridle. A good-quality leather saddle and bridle will reward you with a long service life. Look after it!

Additional reading

Bertram, J. et al. (compilers). (1993). *Breeding for Profit*. 42 pp., illustrated, soft cover, \$15

Written for tropical beef producers, this detailed guide will assist you to define your desired markets, and to determine breeding goals, programs and methods to serve these markets. Also an ideal text for agricultural students.

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