

# Smallholder Cattle Best Practice Manual

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## **Introduction - How better cattle raising system can benefit smallholder farmers?**

As many smallholder Cambodian farmers own cattle, increasing the production and hence profitability of these animals is a potential path to improve smallholder household income. This manual is designed to provide smallholder farmers with some basic information on cattle husbandry including production, optimising health, disease prevention, biosecurity, breeding, nutrition, and accessing markets. The ultimate aim is to produce quality cattle, which can obtain the best market price and monetary return to the smallholder beef producer. This information is provided in brief, and smallholder farmers seeking more advice and details should seek out further information from their Village Animal Health Worker or District Veterinarian for further advice.

## **Social and financial benefits of better feeding, disease prevention and better cattle**

Cattle are an increasingly important resource for smallholder farmers in Cambodia, providing a store of wealth, use for income generation by sale, availability for draught, plus are increasingly important for supply of manure for fertiliser or household through bio-digestion. It is very important to understand how to best manage this important asset, enabling the value of the animals to grow as quickly as possible and protect this value. This means attention to improving nutrition and providing disease risk management, resulting in more calves produced and more meat on animals for sale, resulting in higher prices and more income for the family for health, education and other needs.

It is widely accepted that the demand for red meat and particularly from cattle and buffalo in SE Asia will continue to grow quickly for many years, as neighbouring countries become wealthier. This means re-investing in improving cattle health and production is a sound approach for smallholder farmers. Forages provide better quality nutrition for cattle for fattening and improving reproductive rates. They also reduce the time required for 'cut and carry', so enabling other income generation activities to be explored and providing children with more time to attend to educational needs.

## Farmer Learning & Community Benefits

Developing and improving farmer knowledge and skills will help increase livestock productivity, improve efficiency and lead to higher smallholder farmer profitability.

The key areas of farmer knowledge to achieve these goals are;

Knowledge topic	Techniques	Outcomes
Improving cattle nutrition	Developing forage cultivation, targeted feeding, selective feed types, and stock separation	Achieving higher cattle body weights and receiving a premium purchase price and <u>higher income for farmers</u>
Improving cattle health	Protecting from disease using strategic parasite treatments and vaccination, disease knowledge and protection strategies	Reduced impact of endemic diseases <u>protecting farmer asset value</u>
Improving biosecurity	Reducing exposure of cattle to infectious diseases, through reduced movement, reduced cattle-to-cattle contact, reduced fomite contact	Reduced impact of endemic diseases <u>protecting farmer asset value</u>
Improving reproduction	Targeted bull selection, preferred mating timing, feeding the pregnant and lactating cow, calf feeding and management, strategic weaning	Increasing calf production will result in <u>higher income for farmers</u>

Improving cattle health and production can have wide reaching benefits across the community, which include;

Community benefits of improved health	Community benefits of increased production
Reduced endemic disease occurrence	Trader preference for heavier and healthier cattle
Reduced cattle weight loss and death	Steady supply of cattle for trader
Increased cattle production	Higher price for cattle sold
Reduced labour	Reduced labour
More calves produced	Market development, value added products, business development

## Production

- Housing versus free grazing

Cattle are commonly housed in Cambodia, often in pens under the family house or in purpose built pens adjacent to the house. These animals are usually tethered on the rice paddies in the dry season for grazing or by the roadside in the wet season where they may be given access to rice straw. It is also still a common practice in some areas to take cattle to forest lands for free-grazing. Whatever system is used for housing, animal's need an abundance of nutrition, access to a plentiful supply of clean water, shade or shelter and an ability to move about and interact with each other socially, so normal behaviours such as 'heat' can occur. What is apparent is that for many large ruminants in Cambodia both systems do not provide the animals with sufficient opportunities to forage to meet their energy needs. Planting of forages is usually needed to provide the nutritional needs of cattle, particularly in rice growing areas where there is energy deficiencies is present all year and the majority of the cattle remain continuously in poor condition.

- Breeds

So-called local cattle or *gor srok* are small early maturing generally quiet animals growing to a mature weight of 250-350kg, with a small hump suggesting *Bos indicus* origin. They are commonly found in rice-producing areas and are well adapted to lower energy diets.

The Haryana breed and their crosses predominate in Cambodia as they are a larger *Bos indicus* animal, weighing up to 500kg if fed well, so are more suited to draught than local cattle. They are not as quiet as the local cattle and require feed for maintenance.

Brahman cattle and their crosses are another *Bos indicus* type that are increasingly common but have higher feed requirements, walk slowly and may have poor breeding ability, so are less adapted to Cambodia.

Swamp buffalo weigh 350-600+kg at maturity and are more adapted to low-lying conditions, as they need access to shade and water for temperature regulation. They are suited for draught in heavy, wet soils and can utilise poor nutrients but are decreasing in number due partly to low reproductive rates.

- Breeding Basics

Breeding is often from matings of free-roaming animals where bulls are not selected. The preferred breeding approach is to use selected hopefully superior bulls with a fee for service, the cost relating to the quality of the bull. Heat should occur every 21 days in healthy mature non-pregnant female cattle although the signs may only be present for a few hours and can easily be missed, especially in buffalo and where animals are tethered and unable to display herd behaviours. Signs include restlessness, bellowing, mounting behaviour and vaginal discharge of mucous. It is important to note that it is the cow 'standing' for the mounting by other cows or a bull that is in heat.

Artificial insemination is becoming increasingly common and enables access to superior genetics. However it requires a skilled, trained and experienced technician who understands the care needed with semen storage and thawing, plus able to place the semen correctly in the reproductive tract. Farmers need to have excellent heat detection ability and ready access to the technician to ensure that a viable ovum (egg) is present in the tract when the semen is inserted.

Gestation is generally 9 months and as 2/3rds of the foetal growth occurs in the last 3 months of pregnancy, care of the cow during gestation and particularly approaching, during and after birth is very important to ensure calf survival, a good lactation and improve the chances of her cycling again and becoming pregnant. This means feeding the animal very well in late gestation and throughout lactation as the cow will need 2-2.5 times the energy required for maintenance at this stage of her cycle. Failure to provide this will mean the cow will not come back into heat (commence her oestrous cycle), often until the calf is weaned, so delaying pregnancies and reducing the number of calves per lifetime of the cow. For this reason, using a pregnant or lactating cow for draught is not recommended.

- Husbandry practices

Calves depend on milk for growth for several months and this means feeding the mother with a plentiful supply of good quality forages, either by cut and carry or grazing. Inadequate feed for the cow will mean a rapid decline in supply of milk and the calf will be early weaned and lack the protein required for growth, meaning late maturity, late onset of puberty and potentially poor performance for life. If forages are plentiful, it is possible to early wean a calf (say after 10 weeks of age) provided high quality nutrition is provided to the calf (e.g. Stylo forage high in protein), enabling the cow to potentially 'return to service' more quickly.

Most male calves should be castrated unless the animal has potential as a superior bull. There are a number of techniques available to do this (surgical removal of testes, Burdizzo clamps, rubber rings etc.) but it should only be done an experienced operator with adequate after care to prevent infection.

Female calves kept as replacement heifers must be fed well for optimal growth as poor nutrition affects their life-time production.

Calves are very susceptible to *Toxocara vitulorum*, a roundworm parasite that can cause mortalities. Poor doing calves should be investigated with faecal samples taken and examined under a microscope for worm eggs by an experienced laboratory technician. Treatment within the first 3 weeks of life with an appropriate anthelmintic will manage worm infestations.

In certain areas, calves over 6 months of age, like adult cattle, are susceptible to *Fasciola gigantica* infestation, a fluke parasite that migrates in the liver causing hepatitis and then maturing in the bile ducts where it produces eggs. Again faecal samples are useful to diagnose the problem although tissue damage in the liver at slaughter and the presence of the flukes (often described as 'leaves') can assist. Very few of the commonly available anthelmintics can be used to treat 'liver fluke disease' so help from a veterinarian is advised.

A number of external parasites including lice and ticks can cause 'worry' for cattle and may transmit blood-borne parasites, so are best controlled if they are prevalent. A number of

commonly available acaricides can be used to treat external parasites but again, help from a veterinarian is advised.

- **Monitoring animals**

A very useful technique to evaluate the productive state of an animal is body condition scoring (BCS). This involves simply rating the appearance or even better the body condition by palpation, on a scale from a low of 1 (very skinny) through 2 (moderate) and 3 (ideal) then 4 (fat) to a high of 5 (very fat). The best sites to determine the rating include the ribs, the brisket, the backline and the prominence of the hips. Healthy animals should have a covering of flesh over bony prominences. Animals for breeding should be at least BCS 2 and preferably 2.5 to 3. Animals less than 1.5 are in poor health and need to be investigated. They are either starving such as a lactating cow not receiving sufficient quality forage to feed the calf and maintain her condition, or have a disease that needs to be managed. Unfortunately there are many animals in Cambodia with a BCS of 1.5 or less.

- **Benefits of feeding forages to cattle**

Benefits of target feeding forage crops to cattle and the smallholder farmer and family:

Cattle	Improved health & production	Improved weight gain
		Improved body condition score
		Improved reproduction
		Higher immunity to resist disease
		Improved draft performance
Farmer & Family	Time	Reduced time sourcing cattle feed
		More time for other employment
		Children spend less time tending to cattle, and have more time for school and study
	Income generation	Higher prices achieved for cattle sale
		Income through sale of forages
		Income through sale of forage seeds

## **Animal Health**

- **Disease Recognition and Reporting**

Why are recognising and reporting animal diseases important?

Recognising animal diseases as soon as they start and reporting them to village veterinary workers immediately means disease can be controlled early and limit the impact and economic loss. Early intervention when animals get sick prevents negative impact on animals (prolonged sickness or death) and reduces financial losses to farmer, village, region and possibly country.

Animals show different signs when sick. Some signs like fever or not eating occur with many different diseases and some signs like blisters in the mouth with FMD are very specific for one disease only.

Some common disease signs are:

- Stop eating and drinking
- Lie down a lot
- Keep separate from other animals
- Excretions from eyes, nose or mouth
- Diarrhoea or stop urinating/defecating
- Loss of body condition and/or weight
- Coat looks rough
- Fever (breathing fast, seeking cool areas)
- Sudden death

Rapid identification of sick animals and early diagnosis and treatment can reduce the impact of disease and reduce spread. Obtaining professional expertise from your VAHW (village veterinary worker; department of animal health and production officer) to investigate, take samples, and advise on treatment can be very beneficial.

## **Disease prevention methods**

- **Biosecurity**

Biosecurity is management practices that can be applied by individual farmer or better by groups of farmers or villages to reduce the risk of introducing diseases into their herds or village (or commune or district). Practicing good biosecurity measures are a powerful disease preventative measure and often can be undertaken at minimal cost to the farmer.

Some simple Biosecurity measures are;

- Vaccination of animals for important and high impact diseases such as FMD, HS, & Blackleg
- Not introduce unvaccinated new animals into the village or herd
- Quarantine newly introduced livestock (even if they are vaccinated) in an area separate from any other animals for 2-4 weeks and observe daily for disease signs

- Isolate all sick animals from healthy animals and ensure that they are fed last, using different equipment and avoid mixing in any way with healthy animals
- Observe your livestock daily for good health, and where possible do not allow contact with other animals which have unknown health status
- Ensure your breeding cattle only mix with bulls and cows that have no history disease
- Where possible, avoid your animals congregating with groups of other animals from different areas
- Stay alert to the status of disease in your area and change practices if a disease is threatening your area, discuss preventative options with your VAHW or District Veterinarian

- Vaccination

Vaccination for protecting cattle or buffalo against viral diseases (i.e. FMD) and bacterial disease (HS, Anthrax, Blackleg) are available. Vaccine produces immunity in the animal once administered. This means that if the animal is exposed to a disease at a later stage it is immune or protected and will not become infected, or may be less affected than unvaccinated animals.

Important points to know about vaccines are;

- Storage at fridge (not freeze) temperature all the time until given to animal is necessary, vaccines which are not chilled may be ineffective
- Most vaccines are applied by injection under the skin
- Initial and 'booster' vaccination about 2-4 months apart then annual vaccination is necessary for best protection
- All animals in a herd (or village) need to be vaccinated to provide the best infectious disease protection
- Vaccine is cheap (especially for diseases that cause large outbreaks and many deaths such as FMD and HS)
- Good hygiene and correct injection technique (under skin) prevents large swelling at injection site.

Reasons for vaccine sometimes not working

Sometimes animals that are vaccinated against certain diseases can still become infected.

Reasons for this can be:

- Incorrect dosing; not enough vaccine is given or no 'booster' is given
- Using time-expired vaccine
- Vaccine having been subjected to high temperatures during storage or transportation
- Not all animals in a herd are vaccinated
- The vaccine type did not accurately match the disease type



## Foot-and-mouth Disease (FMD)

What causes FMD infection?	A virus which spreads to cattle from other cattle, buffaloes and pigs
	Infected animals shed the virus in milk, faeces, urine and saliva
	The virus can also be spread on vehicles, shoes, clothing, peoples hands, dogs and equipment
What are the signs in cattle?	High temperature
	Mouth sores and salivation
	Foot sores and lameness
	Teat sores
	Difficulty eating and Weight Loss
	Abortion
	Calves may lose weight
How do I treat infected animals?	Cattle usually recover in 2-3 weeks (however may be thin and weak)
	Alert your village animal health worker
	Isolate to limit disease spread
	Provide shelter, hand feeding, and water
How can I avoid my cattle becoming infected?	Clean feet sores and apply blue metalin spray
	Vaccinate all your cattle every six months
	Avoid all contact with sick animals (cattle & pigs)
	Avoid contact with potentially contaminated material such as cattle trucks, manure, mud, and feed
	Isolate your animals when an outbreak is occurring
	Avoid trading cattle during an outbreak
	Avoid transport of cattle during an outbreak
	Keep people who have had contact with infected animals away from your cattle
Ask about the disease history of any animals before you buy, and don't purchase infected or recently infected animals	

## Hemorrhagic Septicemia (HS)

What causes HS infection?	The disease is caused by a bacteria
	The disease is spread usually from affected cattle and buffalo
	Outbreaks often occur when there is close herding, or at the start of the rainy season
What are the signs in cattle and buffalo?	Sudden death (may be many cattle & buffalo)
	Fever
	Loss of appetite
	Discharge from nose
	Increased salivation
	Laboured breathing
How do I treat infected animals?	Swelling in neck area and under jaw
	Alert your village animal health worker
	Isolate your animals to prevent disease spread
	Provide shelter, hand feeding, and water
How can I avoid my cattle and buffalo becoming infected?	Antibiotic medicines may be useful if provided very early and used correctly
	Vaccinate your cattle every 6 months, aiming to vaccinate 1 month before the rainy season
	Avoid all contact with sick animals
	Isolate your animals when an outbreak is occurring - don't mix cattle
	Avoid trading cattle during an outbreak, and ensure the cattle you purchase have no history of disease
	Avoid transport during an outbreak

## Blackleg

What causes Blackleg infection?	The disease is caused by a bacteria
	The bacteria live in cattle intestines, and are shed onto the soil; other animals may ingest the bacteria while eating
	The disease is not spread from one animal to another by contact alone
	Outbreaks with multiple cattle affected may occur
What are the signs in cattle?	Most often young, well fed cattle
	Lameness, rapid breathing, depression
	Fever
	Loss of appetite
	Swelling of hip, shoulder and chest
	Swelling becomes hot, painful spongy
How do I treat infected animals?	The animal usually dies within 12-48 hours
	Alert your village animal health worker
How can I avoid my cattle and becoming infected?	Treatment with antibiotics may be warranted, however this is rarely successful and the focus should be on prevention
	Use a Blackleg vaccination and vaccinate your calves twice, at 2-6 months of age. In high risk areas revaccinate at 1 year and 5 years of age
	In the event of an outbreak, can vaccinate all susceptible cattle and provide prophylactic penicillin

## **Marketing and trade of Cattle**

- Targeting markets (local, domestic, & export)

When considering sale of cattle, farmers can consider three main markets. These are the ‘local’, ‘domestic’ and ‘export’. It is important to differentiate the ‘product’ to account for different meat markets. There may also be a need for a ‘store’ market for sale of excess stock. Farmers need to consider each market’s requirements before selling as each market has a different requirement. These requirements may include the age of animal, body condition score (BCS), sex, and weight. Knowledge of BCS is important to maintain sale of a consistent product and to guarantee that the animal bought and sold is on a comparable basis and ensure a fair price is being received. Some trader’s buy for specific markets – linking the animal being sold with trader as well as the market is important. Consideration should be given to ‘value adding’ the animal to the specific use e.g. fatten before selling or sell to a feedlot on the border. It is important to ensure consistent quality and quantity to sustain the market.

- When to sell

Animals should be sold when they are ‘market ready’ and not just as a cash source – value adding the animal will increase their asset value.

Farmers may benefit and obtain a higher price by aiming to target specific markets and plan for festivals such as the New Year when prices are higher. By using forage technology, farmers may be able to maintain a high BCS beyond the wet season – essentially extending the beef season by making use of silage and irrigation techniques.

Coordinate the sale of animals so as to improve farmers’ market power and reduce the dominance of the middleman/trader whilst simultaneously increasing returns to producers.

Establish defined market or selling days/times – both at local and regional levels.