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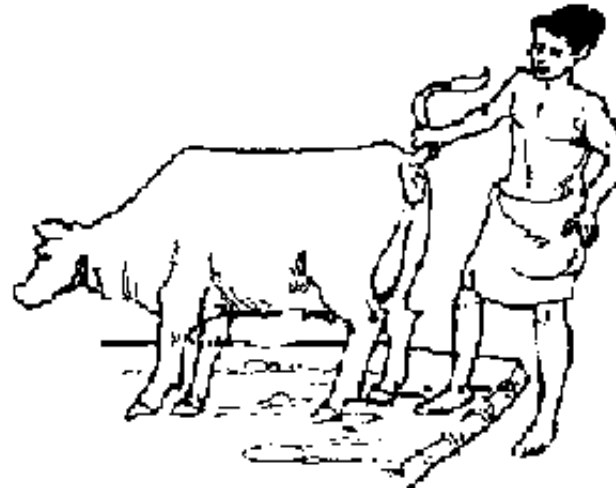
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-  **Udder infection**
-  **Decreased milk flow**

Breeding

Detecting heat

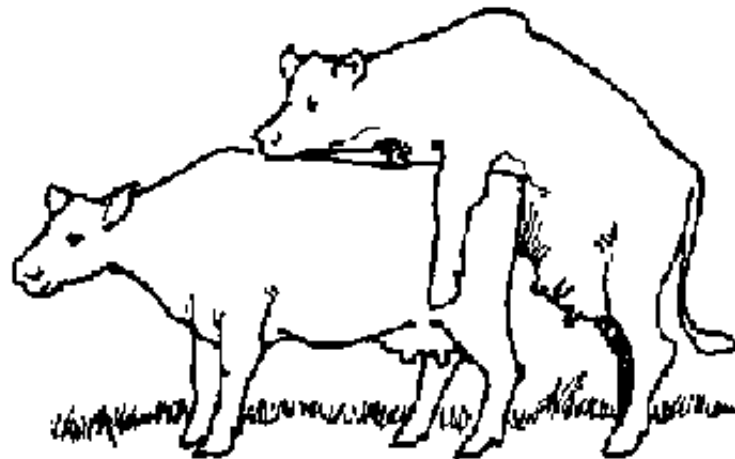
Heat, or "estrus," is the period when the mature female animal is fertile and can be mated. Check the animals for heat when they are resting. Do this early in the morning and in the afternoon. Check again before the animal rests at night.



Detecting heat

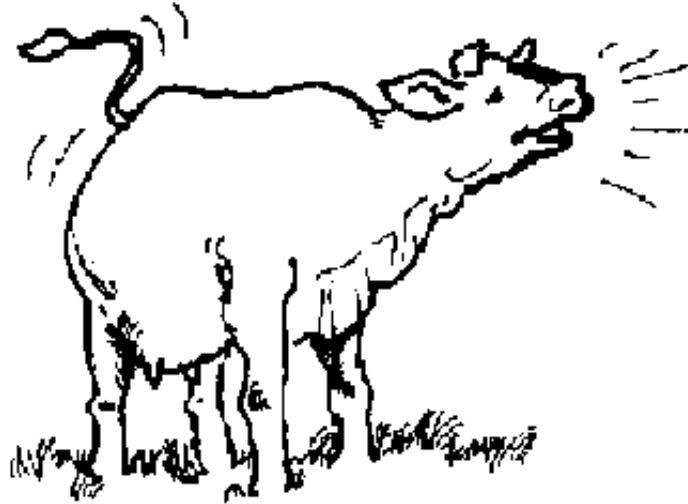
Look carefully for the following signs of heat.

- **The female stands still when she is mounted by another animal (male or female). You can see this happen if the female is untied and allowed to go freely with other animals.**



The female stands still when she is mounted by another animal (male or female).

- **Clear mucus comes out of the vulva. It often looks like a string hanging from the vulva.**
- **The vulva is moist and swollen.**



A cow in heat

- **The animal is restless. A cow in heat bellows frequently. Sheep and goats waggle their tails constantly.**
- **Dairy animals are difficult to milk and production of milk decreases.**
- **Heat can be difficult to detect in buffaloes. Look for frequent urination. The only sure way to detect heat in buffaloes is to present a male to the female and see if he mounts her.**

Breeding

When you see that the animal is in heat, mate it immediately. If the animal does

not become pregnant on the first try, mate it twice within 12 hours at the next heat.

Some cows bleed from the vulva at the end of the heat period. This is a sign that the heat period has been missed so there is no point trying to mate her again until the next heat.

Lack of heat

Sometimes a female does not show any signs of heat even though she is not pregnant.

Causes

- **Loss of weight due to poor feeding.**
- **Overweight.**
- **Mineral deficiency.**
- **Intestinal worms.**
- **Chronic disease.**
- **The animal has just given birth.**
- **The animal is lactating heavily.**
- **Lack of contact with male**

Treatment

- **Improve feeding, especially of mineral-rich feeds (see Feeding, page 108).**
- **Regularly deworm the animals (see Internal parasites, page 38).**

- **Allow the female to stay with a male animal. In Sri Lanka, some stock raisers keep an infertile but sexually active "teaser" male with their female animals to detect heat or to bring the females into heat.**

If the female does not come into heat despite improved management, try one of the following treatments. The dosages are for adult cattle. Use half the dosages given below for sheep and goats.

- **Crush 20 seeds from ripe fruits of *Couropita guianensis* (cannon ball). Mix the powder with 1 liter of water and drench the entire amount once a day for 15 days. Give half of this dose once a day for another 3 days and then $\frac{1}{4}$ of the dose each day for the next 3 days.**
- **Dry in the shade and then powder 1 whole plant of *Leptadenia reticulata* (cork swallow). Put 20 g (1 matchbox) of the powder on top of the animal's regular feed so she eats it with the first mouthful. Or make a bolus of the powder in brown sugar and feed it to the animal. Give this twice a day for 30 days.**

If a male is not sexually active, treat it as follows.

- **Rest the male animal and feed him with protein-rich feeds (see section on Feeding).**
- **Dry and pound: 1 whole plant of *Sida cordifolia* (country mallow), some mature seeds of *Mucuna pruriens* (cow-witch) and the roots of *Asparagus racemosus*. Take 20 g of each of the powdered ingredients and mix them with enough brown sugar to form a bolus. Feed to the animal twice a day for 15 days. (India. 1, 3, 4,**

5)



Treatment for males not sexually active

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 ***(introduction...)***

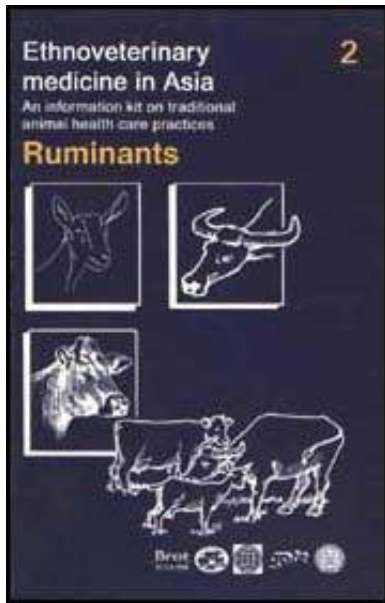
 **Collaborating organizations**
























 **Participants and workshop staff**








 **How to use this manual**

 **Lack of appetite**

 **Fever**



-  **Coughs and colds**
-  **Diarrhea**
-  **Dehydration**
-  **Bloat**
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-  **Care of newborn**
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-  **Decreased milk flow**

Pregnancy and birthing

Care during pregnancy

In India, pregnant animals are allowed to graze with the rest of the herd so that they get exercise and sufficient green fodder. However, towards the end of the pregnancy, the animals are confined and stall-fed. This reduces accidents and allows the farmer to keep a close eye on the pregnant animals. To avoid abortion, farmers do not feed cottonseed or rape seed to pregnant animals.

If animals are in danger of aborting, Indian stock raisers dry and powder whole plants of *Leptadenia reticulata*. They place about 20g of the powder twice a day on top of the concentrate ration of the pregnant animal so that the powder will be eaten first. They continue this treatment for 20-30 days.

In Thailand, farmers add 1 kg per day of rice to the feed of the pregnant animal 1 or 2 weeks before it is due to give birth. They also mix 1 kg of molasses with 10 ml of water and then sprinkle this onto the rice straw feed.

Birthing

You will know if an animal will have normal or abnormal delivery by observing the length of time before the newborn comes out. Normally, a newborn emerges within 6

hours after the water bag comes out. Once the water bag breaks, the birth normally occurs within 2 hours.

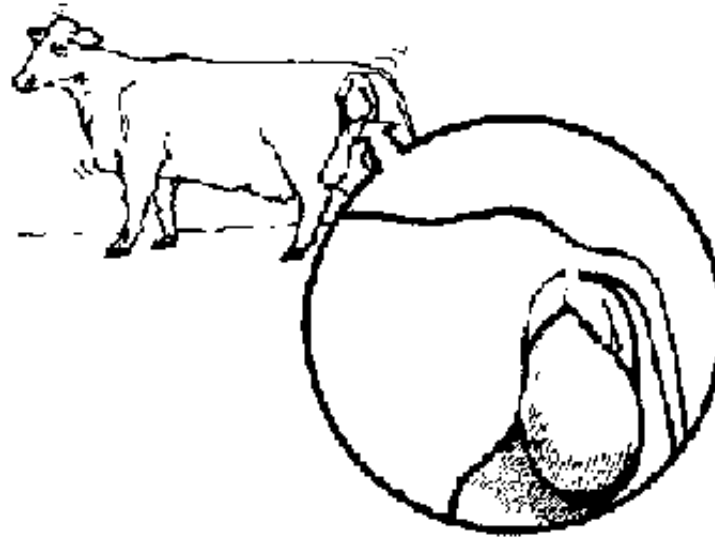
Reminder

Do not interfere with the natural birthing process unless absolutely necessary!

Before giving any assistance to the mother, trim your fingernails very short. Thoroughly wash your arms and hands with soap and clean water. If possible, disinfect them with alcohol.

Inadequate uterine contractions

Symptoms



Birthing

- **The water bag does not come out even after the cow has strained for 6 hours.**

Treatment

- 1. Keep the animal comfortable and quiet.**
- 2. Wash and remove the skin of a fresh Aloe vera leaf Rub it gently on the vulval lips, on the inside of the vagina and on the cervix.**
- 3. If no change occurs within 3 to 6 hours, consult a veterinarian or anyone in the community experienced in attending to difficulties at birth in animals. (Sri Lanka. 1, 2, 3, 4)**



Inadequate uterine contractions

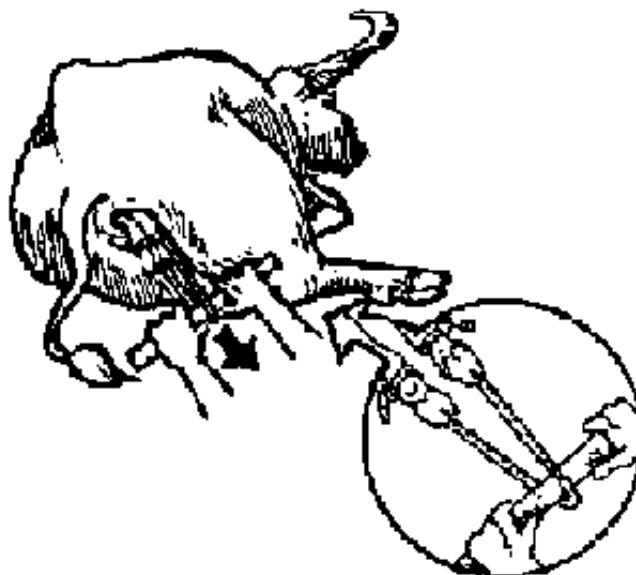
Prolonged delivery

Symptoms

Six hours after the legs and head of the offspring have appeared, if delivery has not yet been completed, try the following. This technique is used by stockraisers throughout Asia and is similar to techniques used by Western veterinarians.

- 1. Disinfect a 1 meter-long rope by washing it in laundry detergent. Bath soap can be used, too.**
- 2. Carefully tie each end of the rope a little above the hoof joint of each of the front legs of the baby animal.**

- 3. Insert a clean stick about 30 cm in length through the loop.**
- 4. Pull on the stick only when the mother pushes.**
- 5. Pull the baby animal only towards the udder. Never pull it straight out or upwards.**
- 6. Occasionally the hind legs come out first. Make sure that both are hind legs and not one front and one hind leg. If both are hind legs, tie the rope on in the same way as above and pull when the mother pushes.**



Helping the mother's delivery

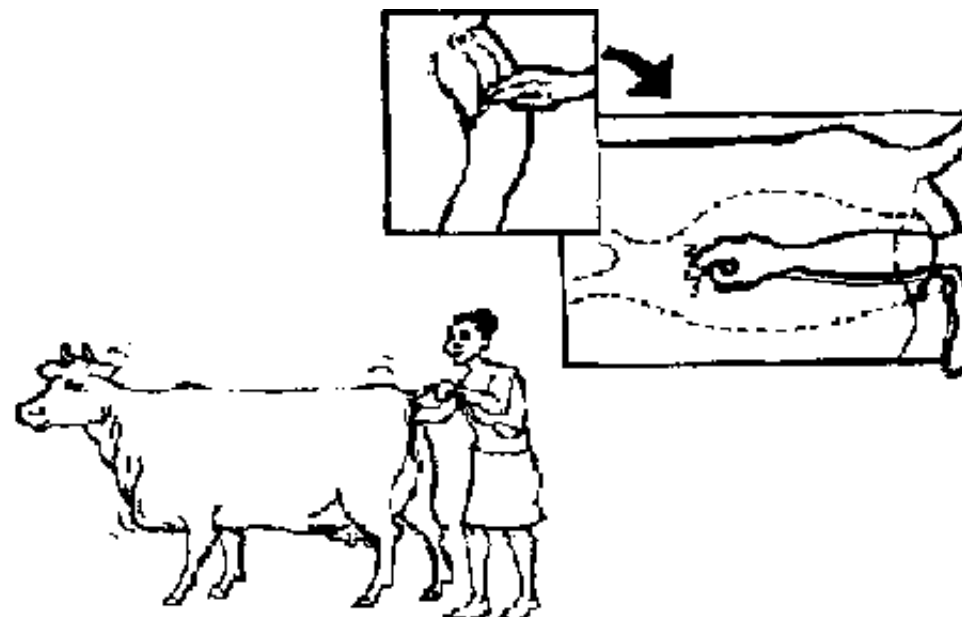
Retained placenta or "afterbirth"

If the placenta does not come out within 12 hours of birthing, try doing the following:

- **Boil ½ kg of fresh bamboo shoots (*Bambusa* sp.) in 2 liters of water until the water is reduced to about half the amount. Cool the liquid and give the entire amount as a drench in one dose. (Sri Lanka. 1, 2, 3, 4)**

If the afterbirth does not come out in the next 12 hours, get professional help. If help is not available, do the following. This is a technique commonly done by both traditional and modern veterinary doctors.

- 1. Clean your hands thoroughly and apply vegetable oil to them as a lubricant.**
- 2. Cup one hand into a cone-shape.**
- 3. Insert this hand into the vagina following along the length of the placenta and reaching as far as you can. Grasp the placenta.**
- 4. Carefully separate the placenta from the uterus with your fingers and then take out as much as you can. The animal will deal with the placenta remaining inside the uterus in its natural way. It will not reduce the chances of the mother's bearing more offspring. The farmer can do this alone or with the help of a local livestock specialist. Make sure not to introduce any kind of infection into the vagina.**



"Afterbirth"

@ Caution

Do not hang heavy weights on the membrane coming out of the vagina. This will be very harmful to the cow.

After removing the retained placenta, use one of the mixtures below to control bleeding from the uterus. These treatments will also help to contract the uterus.

Boil 200-300 g of *Linum usitatissimum* seeds in 1 liter of water until only half the water remains. Drench all this amount twice a day for 7 days. (India. 1, 3, 4, 5)

20g *Zingiber officinale* (ginger) rhizome.

30g *Peucedanum graveolens* seeds.

30g *Trachyspermum ammi* (bishop's weed) seeds.

30g Trigonella foenumgraecum (fenugreek) seeds.

20g Nigella sativa (black cumin) seeds. 20g Asparagus racemosus (asparagus) roots.

20g Bamhusa sp. (bamboo) leaves.

10g Saraca indica (ashoka) tree bark.

10g Pedalium maurex bark.

Powder these ingredients and mix in 1 liter of water. Boil the mixture until only half the water is left. Give as a lukewarm drench 2 times a day for 7 days.

After drenching the decoction, mix the remaining pulp with Linum usitatissimum (linseed) seeds, molasses or brown sugar and feed it to the animal. (India. 1, 3, 4, 5)

• Make a decoction of 1 kg of guava (Psidium gunjava) leaves in 4 liters of water. Cool the liquid and then using a clean cloth, wash the vagina. (Philippines, Sri Lanka.1, 2, 3, 4, 5)

Vaginal bleeding

Continuous bleeding from the vagina after birth is generally due to injury to the vagina or uterus during birthing, whether by accident or mishandling.

Prevention

If assistance is given in deliveries, minimum force should be applied and care taken not to injure the vagina or uterus.

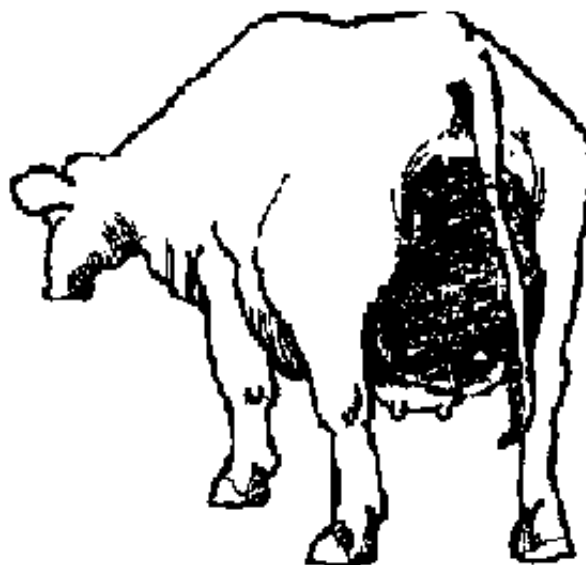
Treatment

- **Take 50 g of fresh *Acacia arabica* bark and 50 g of dried sesame seeds. Powder separately and mix together with 50 g of brown sugar. Make a bolus and put into the mouth of an adult animal twice a day for 2-3 days or until the bleeding stops. Give half of the dosage to small animals. (India. 1, 2, 3)**

Prolapse of the uterus

Sometimes the entire uterus comes out of the vulva after birth. It will look like a red, inflated inner tube of a car tire. If this happens, seek professional help. While waiting, do the following. Stockraisers in most Asian countries know of this technique.

1 If the animal is lying down, gently clean and wrap the uterus with a large, clean cloth. Be sure not to injure the uterus.

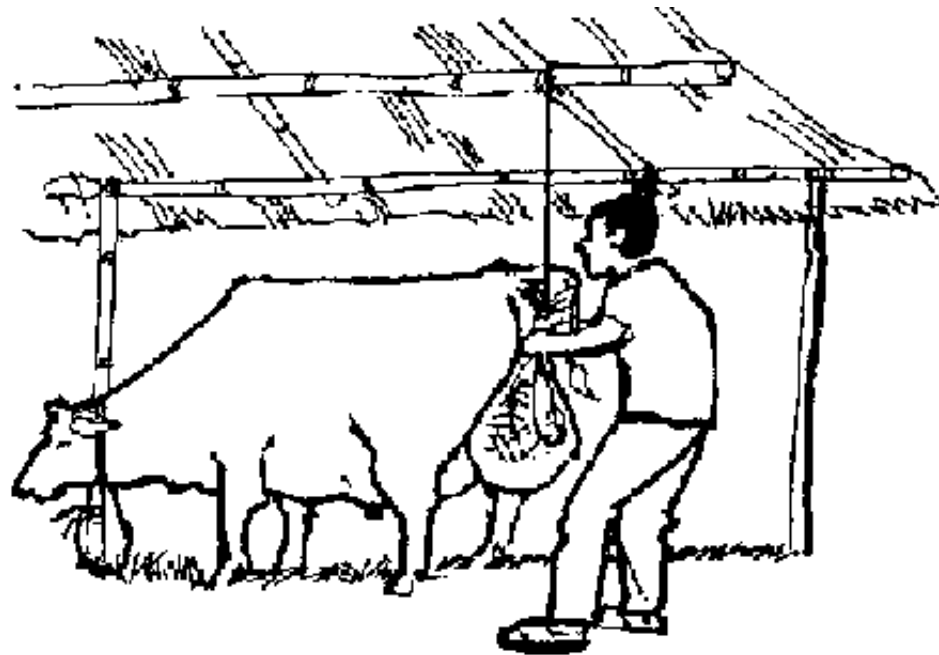


Prolapsed uterus

2. If the animal is standing, wrap the uterus with a large cloth. Raise the uterus up with another large cloth. Tie the cloth to the roof of the shed so the uterus is parallel to the ground. Firmly tie the animal to a post in such a way that it cannot move about.

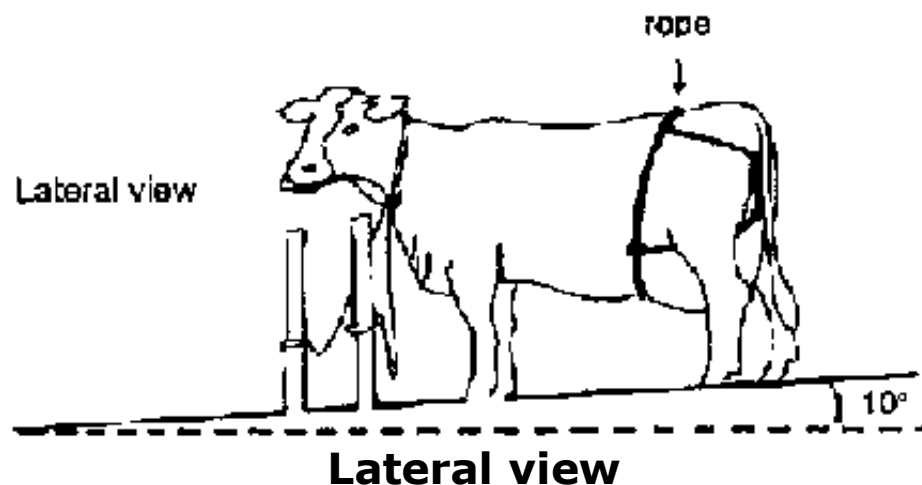
To replace the uterus inside the abdomen, do the following:

- 1. Tie up the animal on a sloped surface as shown in the picture. This sloping position will help the uterus stay in place.**
- 2. Mix 2 tablespoons of alum powder or sugar in 2 liters of water. Apply this to the surface of the uterus. This will make it shrink slightly.**
- 3. Push the uterus back in with your clean hands.**



Tie up the animal on a sloped

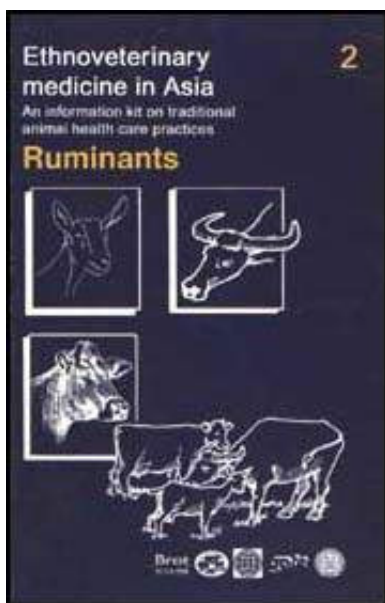
4. When the uterus is replaced in the abdomen, press a rope in between the hind legs and over the tail and tie it up as shown in the picture. This will keep the vulval lips tight and supported for a few days. This will prevent the prolapse from occurring again.




































Posterior view

Posterior view



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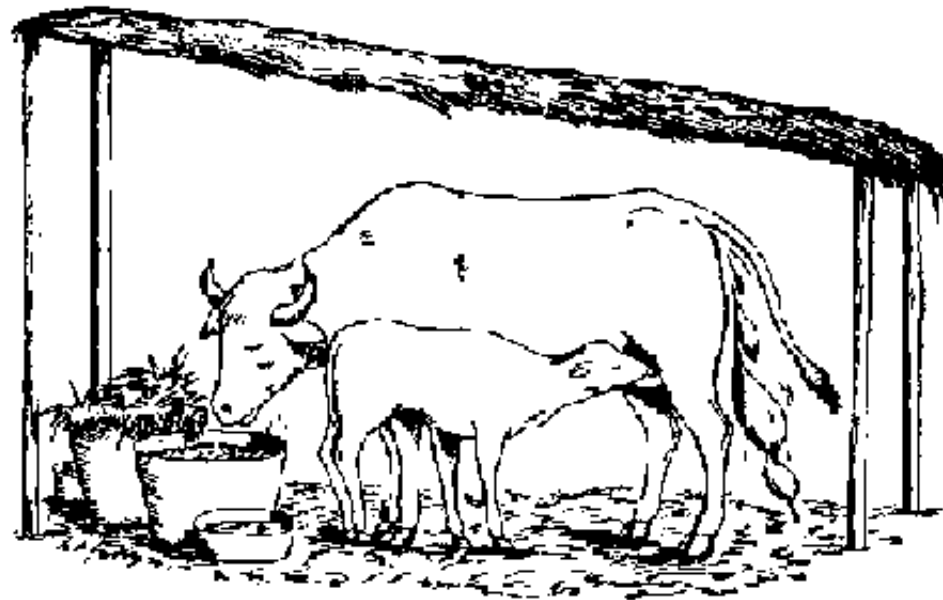
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- 📄 **Pregnancy and birthing**
- ➔ 📄 **Care of mother animals after birthing**
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Care of mother animals after birthing

Little should be done to interfere with the natural birthing process. The calf should be allowed to suckle the mother immediately. This helps expel the placenta or afterbirth.



Figure

Feed for the mother after calving

Any of the following mixtures can be given to the mother immediately after calving. They act as a uterine tonic, help cleanse the uterus, expel the placenta and dispel gas from the rumen of the mother.

- **Grains: Finger millet (*Eleusine coracana*) seeds. Sorghum (*Sorghum vulgare*) seeds. Millet (*Pennisetum typhoideum*) seeds. Wheat (*Triticum aestivum*). Rice (*Oryza saliva*).**

Cook 1 kg of any of these grains with about twice as much water to make a gruel (porridge). Then take the following ingredients:

Cumin (*Cuminum cyminum*) seeds. Bishop's weed (*Trachyspermum ami*) seeds. Fennel (*Foeniculum vulgare*) seeds. Black pepper (*Piper nigrum*) seeds. Fenugreek (*Trigonella foenum-graecum*) seeds. Asafoetida (*Ferula assa-foetida*) gum.

Pound together 10 g of each of these ingredients with 50 g of brown sugar. Mix the powder into the gruel and cook. Feed the whole amount to the mother cow twice a day for 1 week after the birth. For sheep and goats, use half of these quantities. (India. 1, 2, 3, 4, 5)

- **Asafoetida (*Ferula assa-foetida*) gum. Bishop's weed (*Trachyspermum ami*) seeds. Cloves of garlic. Brown sugar.**

Grind together 50 g of each of these ingredients. Divide into 3 equal parts. Feed to the mother cow in the morning and evening and the following morning. Wait 1 day, then repeat the treatment once. Use half these amounts for goats and sheep. (India. 1, 2, 3, 4)

• **Mix 3 teaspoons of fenugreek (*Trigonella foenum graecum*) seeds with 1 kg of cereal and ½ kg of brown sugar. Cook together with 2 liters of water. Give this amount once a day to milking cattle. Use half this amount for sheep and goats. (India. 1, 2, 3, 4)**

Boil 500 g of linseed (*Linum usitatissimum*) seeds in 1-2 liters of water until half the water remains. Drench 500 ml of the liquid. Repeat once a day for 3 days. This helps the mother gain weight after birthing. For goats and sheep, use 200 g of seeds. (India. 1, 2, 3, 5)

- **2 thumb-sized dried ginger rhizomes (20 g).**
- 30 g (1 handful) *Peucedenum graveolens* dried seeds.**
- 30 g *Trachyspermum ammi* (bishop's weed) dried seeds.**
- 30 g *Trigonella foenum-graecum*? (fenugreek) dried seeds.**
- 20 g *Nigella sativa* (black cumin) dried seeds.**
- 20 g *Asparagus racemosus* (asparagus) dried roots.**
- 20 g Bamboo leaves (dried).**
- 10 g *Saraca indica* (ashoka tree) dried bark.**
- 10 g *Pedaliium maurex* dried leaf, stem or fruit.**

These quantities are enough for 2 doses for a cow or buffalo (use half the dosage for a sheep or goat). Grind these ingredients together to make a powder. Boil in 1 liter of water until half of the water remains. Separate the liquid and give the liquid as a lukewarm drench twice a day for 7-10 days after the birth. (Northern and Western India. 1, 2, 3, 5)

- **You can use the solid pulp left after preparing the remedy above. Mix it with 100-**

200 g brown sugar or 300-500 g of boiled linseed (*Linum usitatissimum*) seeds and feed it to the mother animal. (India. 1, 2, 3, 5)

Improved nutrition to increase milk production

Farmers feed the mother animals with green fodder, concentrates (such as rice bran, copra, molasses and groundnut cake) and other feed-stuffs that are rich in energy, protein, minerals and vitamins. Farmers in Indonesia give the water used to boil vegetables. This improved diet increases milk production.

The table at the end of this section contains examples of feed given to mother animals after birth. The quantities listed are for cows and buffaloes. Use half these quantities for sheep and goats.

Specific medicinal plants to increase milk production

These remedies stimulate milk production. See Decreased milk flow (page 141) for further remedies.

- Provide fresh leaves of *Leptadenia reticulata* as feed. (Throughout India. 1, 2, 3, 4, 5)**
- Grind together 3-4 handfuls of fresh *Leptadenia reticulata* leaves, 10 seeds of black pepper (*Piper nigrum*) and 50 g of brown sugar. Feed this to a mother cow or buffalo 1-2 times a day until the milk production increases. Give half this amount to goats and sheep. (India. 1, 2, 3, 4, 5)**
- Cut *Launaea pinnatifida* (pathri) grass and feed to the animal. Give as much as**

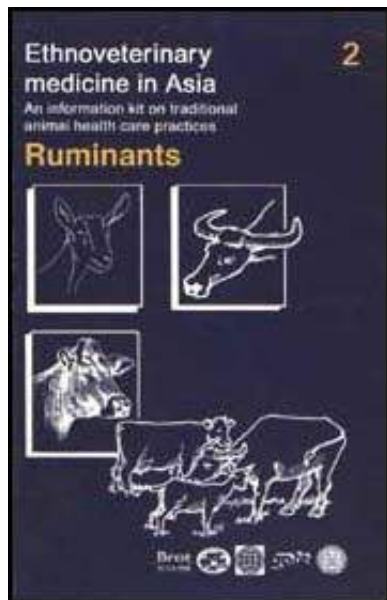
the animal will eat. (Maharashtra, India. 1, 2, 3, 4)

Examples of feed given to mother animals after birth

















Scientific name	Common name	Part	Dosage	Application
Moringa oleifera	Drumstick	Leaves	As much as animal will eat	Feed (India)
Dolichos uniflorus	Horsegram	Seeds	1 kg	Soak in water overnight. Feed in the morning. (India)
Ricinus communis	Castor	Fresh leaves	3 handfuls	Feed (India)
Cocos nucifera	Coconut	Pulp of nut	3-4 nuts	Feed once a day(India, Indonesia)
Crotolaria juncea	Sun hemp	Fresh leaves	3-4 handfuls	Feed 2-3 times a week(India)
Glycine max	Soybean	Waste from making tofu (tahu, bean curd)	3-4 handfuls	Feed.





















	Eggs and honey		10 eggs and ¼ kg honey	Feed once a week for 1 or 2 weeks. (Indonesia)
Manihot esculenta	Cassava	Roots	As much as animal will eat	Peel the skin, cut into pieces, air-dry for 3-4 days. Feed.
Mangifera indica	Mango	Peels, ground kernels, leaves	As much as animal will eat	Feed. (India)
	Copra, rice bran, copra meal, molasses(concentrates)		As much as animal will eat	Feed either alone or mixed together. (India, Indonesia, Philippines)
Sauropus androgynus	Katuk (Indonesian)	Leaves	1 kg	Boil leaves in 1 liter of water. Add 1 teaspoon of salt. Feed leaves and water every 2 days for 1 week. Continue as long as needed. This dosage is for sheep and goats. (Indonesia)
Carica papaya	Papaya	Leaves	2 leaves	Boil leaves in water. Feed leaves and water every 2 days for 1 week. (Indonesia)

Artocarpus heterophyllus	Jackfruit	Leaves	5-10 kg per day	Feed to animal with grass for 2-3 days. (Sri Lanka)
Bassia latifolia	Mahua	Dried flowers	1 fistful (50 g)	Feed once a day. (India)



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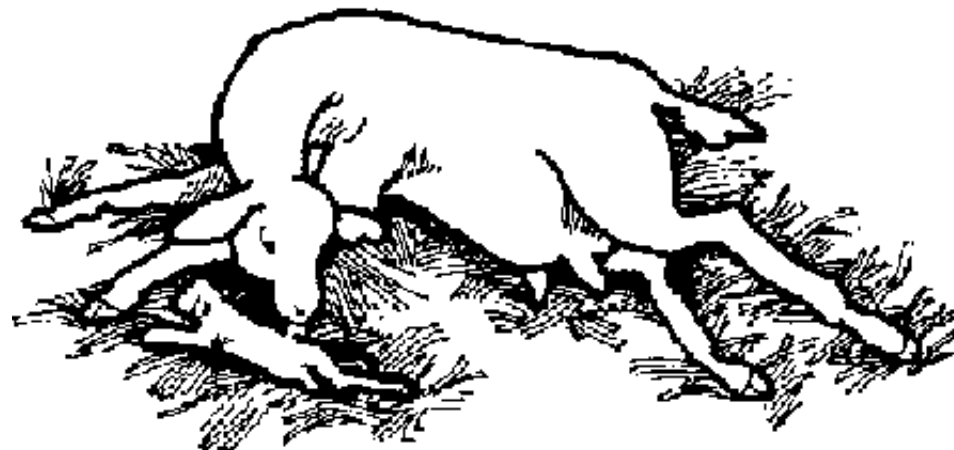
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Care of newborn

Right after birth

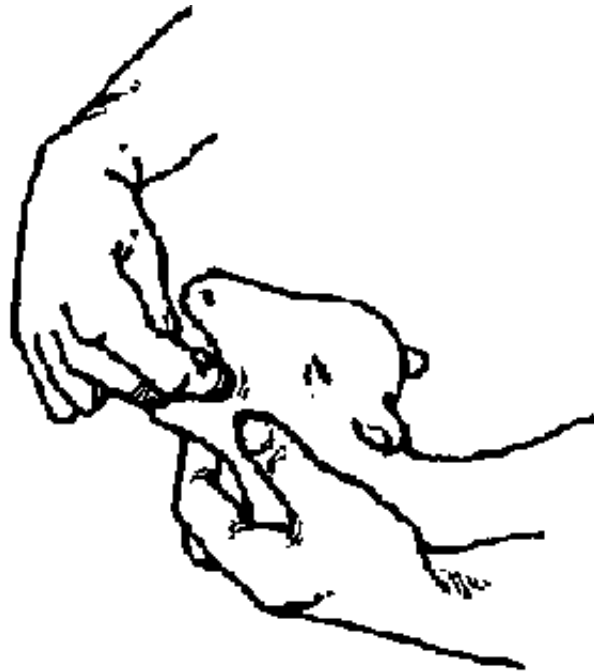
Allow the mother to lick the newborn and clean it completely. This also helps to induce milk flow in the mother.



Right after birth

If the mother does not lick the newborn thoroughly or is too weak to lick, help clean the newborn. Dry it with a clean, rough cloth and remove any mucus from its nostrils. Rub this cloth on the hooves to remove their plastic-like coating.

If the newborn is not breathing properly, insert a clean finger into the mouth to remove all mucus. Use a rice straw to tickle the nostril to make the newborn sneeze. This expels the mucus blocking the breathing passage.



Expelling the mucus blocking the breathing passage

Navel cord

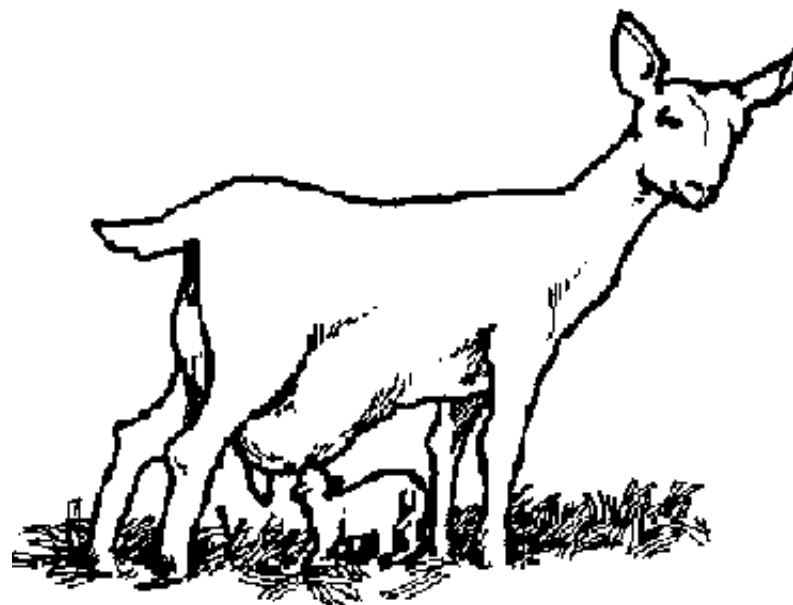
You can choose any of the following practices to dry the navel cord. These practices also prevent bacterial infection and infestation by maggots.

- **Apply a spoonful of turmeric powder to the navel. Apply urine from the mother animal onto the navel.**
- **Pound 1 medium-sized bulb of garlic and apply it to the navel.**
- **Cover the navel with fresh, cooled kitchen ash.**
- **Apply vegetable oil to the navel and then cover it with wood ash.**

Do not pull or irritate the navel cord unnecessarily. This could lead to hernia, a swelling in the navel region.

The mother's first milk

Within 2-4 hours, the newborn ruminant should suck the colostrum. This is the first milk from the mother. The colostrum contains antibodies that will provide resistance to diseases in the newborn's life.

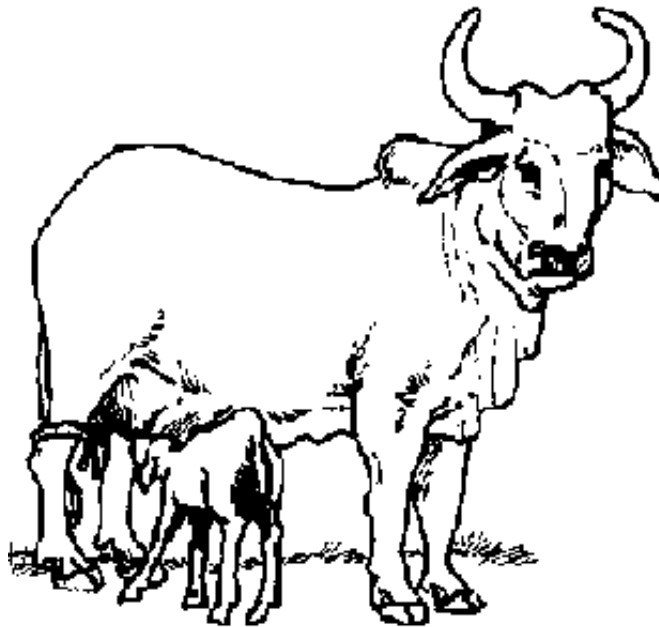


The mother's first milk

Reintroducing the newborn to its mother

Sometimes the mother refuses to accept her calf, kid or lamb. This usually happens when it is her first-born. In this case, you may try one of the following:

- **Sprinkle milk on the nose of the mother and her newborn. Then, allow the mother to smell the newborn.**
- **Rub the rear end of the newborn on its mother's nose.**
- **Rub the newborn with vinegar or with the mother's urine.**
- **For cattle and buffaloes, tie the hind legs and horns of the mother to prevent her from kicking or hitting the newborn. Allow the newborn to suckle for 15 minutes and then free the mother. You may need to do this for three successive feedings, after which she usually will accept the newborn**



Reintroducing the newborn to its mother

Fostering

If the mother has died, try to introduce the newborn to another female which has recently given birth. If she refuses to foster the newborn, try any of the practices suggested for reintroducing the newborn to its mother. If this does not work, milk the lactating animal and feed the newborn, using a small cup. Or you can dip some cotton in some milk and allow the newborn to suck on it.

Housing

Keep the mother and its offspring separated from the rest of the herd to prevent other animals from hurting the newborn. Provide clean, dry bedding for the newborn. If the barn has a slatted floor, cover it with grass or other materials. Otherwise, the newborn may get its legs caught between the slats.

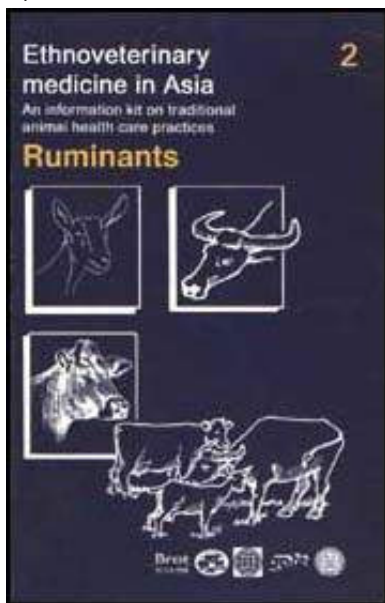
Feeding To stimulate the appetite of the newborn, place one of these mixtures on its tongue:

- **A pinch of salt and 1/2 teaspoon of brown sugar. (India. 1, 2)**
- **Half a teaspoon of brown sugar and 1/2 teaspoon of sweet soy sauce. (Indonesia. 1, 2) Some farmers do this for several days.**























Reminder














Do not intervene with the natural process of giving birth and early care by the mother unless absolutely necessary.





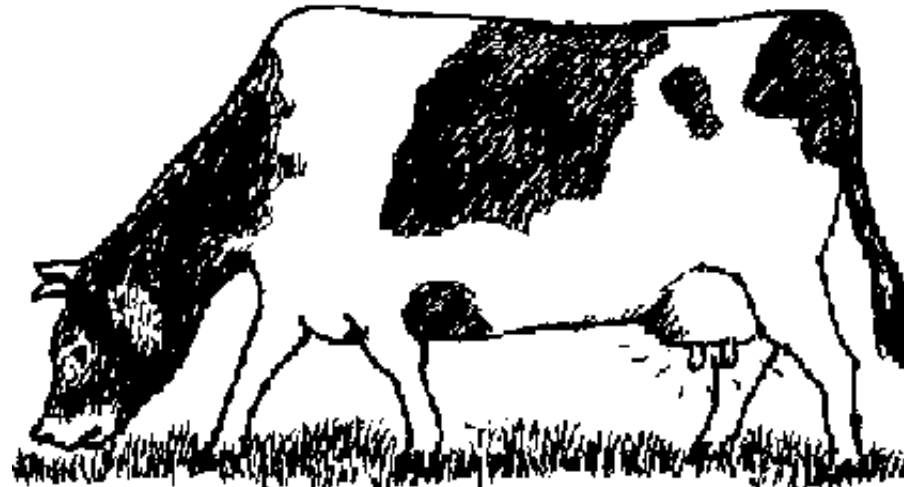
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Udder infection

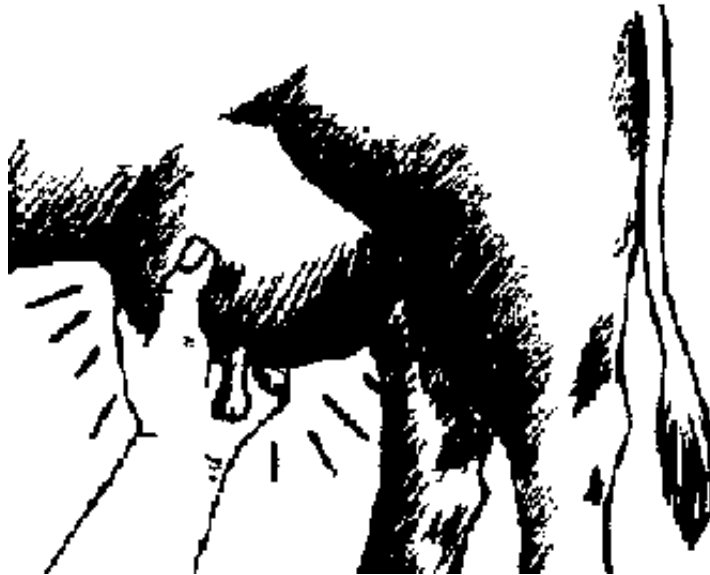
Udder infection (mastitis) and sore teats are common in milking ruminants. Prime milkers are more prone to udder infection. Animals with long teats may easily get teat infections.



Udder infection

Symptoms

- **Cracked teats.**
- **Wounds, tenderness, swelling.**
- **Hard, knob-like, painful udder.**
- **Animal does not permit milking.**
- **Small curdles occur in milk.**
- **Udder feels hot (in severe mastitis).**
- **Milk can become watery or pus-like.**



Infections

Causes

- **Milking with the thumb inside the fist, touching the teat (see diagram in Decreased milk flow, page 141).**
- **Effect of cow pox or foot-and-mouth disease.**
- **Bad hygiene, leading to infection.**
- **Rough milking.**
- **Not fully draining the udder during milking.**

Prevention

- **Practice good hygiene.**
- **Use proper milking methods.**
- **Completely drain the udder of milk during milking.**
- **Inspect the herd frequently.**

Treatment

Sore teats

- **Gather fresh leaves of Ocimum sanctum, Ocimum basilicum or neem. Crush the leaves to obtain 10 ml juice. Mix with 80-100 g of butter or edible oil. Apply on teats 23 times a day until fully recovered. (India. 1, 2, 3, 4, 5)**

Mastitis

Use one of the following treatments.

- **Gather 200 g each of fresh Ocimum sanctum (or Ocimum basilicum) and neem leaves. Boil in 500 ml of vegetable oil for 1 hour over a slow fire. Strain through a clean thick cloth. Store in a sterilized bottle.**

After milking, inject 5 to 10 ml of this oil in affected quarters of the udder using a milk siphon. Do this twice a day until healed. (India. 1, 2, 3, 4)

- **Massage the infected udder with lukewarm water. This helps especially in early cases to reduce the swelling. You can also add a handful of guava or neem leaves to the boiling water. (Philippines. 1, 2, 3, 4)**

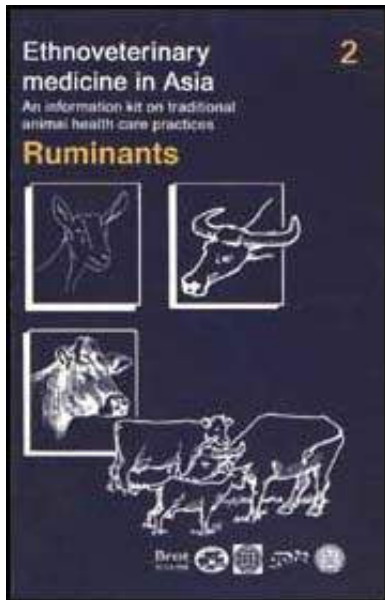
- **Boil a bucket of water. Dip a thick cloth in the water while it is still hot. Wring out the excess water and hold the cloth on the udder. You can also add a handful of guava or neem leaves to the boiling water. (India. 1, 2, 3)**
- **Pound and boil equal amounts of *Fumaria officinalis* and *Litsea sabifera* leaves in enough water to make a paste. Add a pinch of baking powder. Apply the warm paste on the udder. (India. 1, 2, 3)**

For initial stages of infection





















- **Grind together 1-2 ripe bananas, 2 tablespoons of powdered, dried turmeric rhizome and 1 teaspoon of salt. Give this mixture as feed in the morning and evening and again the following morning. (India. 1, 2.4)**

@ Caution

- **To prevent the infection from spreading, milk the healthy animals first, then the sick ones**
- **Practice full milking. Strip the udder completely.**
- **Wash your hands with soap before and after milking.**
- **Discard and destroy milk from infected udders.**
- **Use the siphon in the teat very carefully. If you have no siphon, use the end of a hollow feather. Boil it before using.**



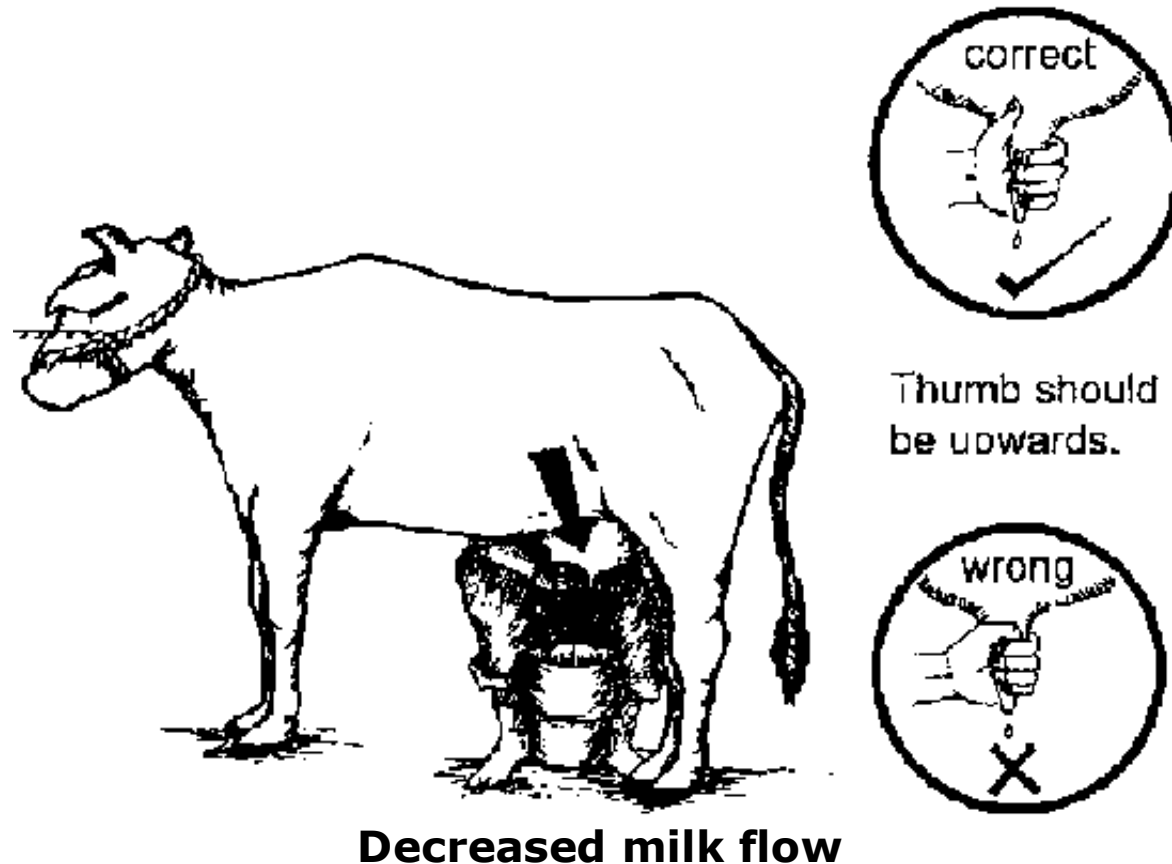
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Decreased milk flow

The milk flow from all types of ruminants may decrease for several reasons: for instance, disease or the loss of a calf or kid at birth. Some animals are also normally hard milkers. Decreased milk flow usually occurs in an animal's first three lactations.



Cows, goats and sheep normally give their maximum milk yield during their second and third lactations. Buffaloes give their highest yield in their third and fourth lactations.

Symptoms

- **Animal produces less milk than expected (for instance, compared to previous lactations).**
- **Milk is drawn with difficulty.**
- **Sudden drop in milk production.**

Causes

- **During or after disease.**
- **Loss of calf or kid at birth. Hard milkers.**

Prevention

- **Proper health care.**
- **Feed coconut cake or cotton seeds.**
- **Supplement the feed with grasses such as *Andropogon annulatus* (marvel grass), *Panicum isachne* and *Cynodon dactylon*.**
- **Supplement the feed with sugarcane (cane and tops).**

Treatment

The dosages given below are for cows and buffaloes. Use half the dose for sheep and goats. Give any of the treatments for at least 15 days.

- **Dry and powder 5 g of *Breynia patens* leaves or bark and 10 g of *Leptadenia reticulata* leaves or bark. Mix with 1 liter of water. Drench twice a day. (India. 1, 2, 3, 5)**
- **Dry and powder black cumin (*Nigella saliva*) seeds. Mix with 1 liter of water. Drench twice a day. (India. 1, 2, 3, 5)**
- **Feed the animal twice a day with 1-2 kg of chopped sugarcane leaves or 200-300**

ml of sugarcane juice. (India. 1, 2, 3)

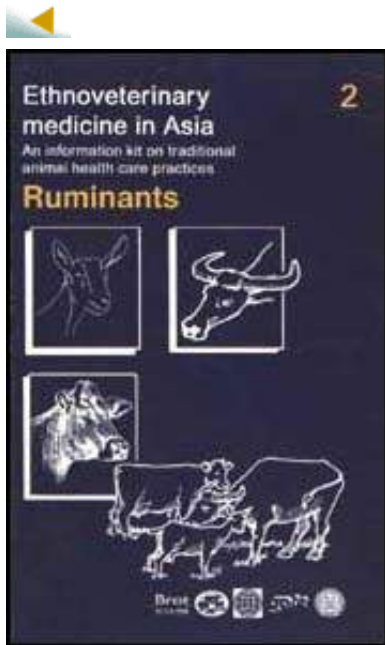
- **Dry and powder 10 g musk mallow (*Abelmoschus esculentus*) seeds, roots or leaves (10 g is approximately 25 leaves). Mix with 1 liter of water and boil for ½ hour. Allow to cool. Drench twice a day. (India. 1, 2, 3)**
- **Feed the animal with 1 liter of water from cooking rice, flavored with a little salt. Do this for 20-30 days. (Thailand. 1, 2)**

Use one of the following remedies. Use the amount given as a "top dressing": add it on top of the concentrate (such as rice bran, wheat husks, lentil husks, cotton seeds, groundnut oilcake) so the animal will eat it with the first mouthful. Do not mix it with the feed. These remedies are also used to prevent abortion during the first month of pregnancy, after the removal of retained placenta and to maintain the pregnancy in case of threatened abortion. Sometimes' they are tried to treat female infertility.

Dry the whole plant of *Leptadenia reticulata* (cork swallow) in the shade. Grind to a powder. Add 1 matchboxful (20 g) to the concentrate as a top dressing. Do this once a day for 15-30 days. The milk yield should increase after 4-5 days. (India. 1, 2, 3, 5)

- **Dry the roots of *Asparagus racemosus* (asparagus) in the shade. Grind to a powder. Add 1 matchboxful (20 g) of the powder to the concentrate as top dressing. Do this once a day for 30 days. (India. 1, 2, 3, 5)**
- **The two remedies above can also be used in combination (20 g of *Leptadenia* + 10 g of *Asparagus*). (India. 1, 2, 3, 5)**

• **The following ingredients can also be added to the mixtures above: 10 g of dried, ground seeds of *Nigella sativa* (black cumin) or 10 g of dried, ground roots of *Withania somnifera* (winter cherry). (India. 1, 2, 3, 5)**



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How to use this manual

This is one of four manuals on traditional animal health care practices (or "ethnoveterinary medicine") in tropical Asia. The manuals were compiled during a participatory workshop held at the International Institute of Rural Reconstruction

in July 1994. The four manuals cover swine, poultry, ruminants (cattle, buffaloes, sheep and goats) and general information. For details, see the General information manual.

The topics in this manual have been broadly presented to include the whole spectrum of "conditions" which a field practitioner may encounter in the care and management of livestock.

Topics which describe a disease or condition present the following information:

Symptoms - key symptom(s) by which the disease can be identified.

Causes - primary cause(s) of the disease.

Prevention - appropriate preventive measure(s) to avoid disease onset.

Treatment - a detailed description of the treatment(s).

The treatments list the ingredients by their botanical (or Latin) name and a common English name. For some commonly known species (e.g., garlic, ginger, coconut, banana, guava), only the English name may appear in the text. The General information manual contains a complete list of plants named in the four manuals.

The treatments or remedies which require multiple ingredients are presented in a step-by-step "recipe" format which lists all ingredients to be used and describes how to prepare them. See the General information manual for details on how to prepare remedies such as fomentations, poultices and decoctions. Many remedies

which require only a single ingredient are presented in tables. Each remedy is identified by the "*" mark; where several remedies are presented the choice of the remedy is left to the user.

After each treatment, the countries in tropical Asia where the treatment is practiced (as validated by the workshop group or through references) are presented in boldface parentheses. Immediately after the names of the countries is a series of numbers that reflect the validation criteria used in the workshop:

- 1. Workshop participants agreed that the treatment would be useful.**
- 2. Treatment is widely used in a region or a country (some remedies were also validated against practices from outside Asia).**
- 3. Workshop participants had first-hand knowledge of the remedy's use on-farm.**
- 4. Traditional healers are known to use the remedy.**
- 5. The remedy is cited in the literature in one of two ways: (1) it is used to treat the same problem in humans or another animal species; or (2) this plant has proven pharmacological activity to treat the problem in question. For instance, laboratory tests have shown that *Nicotiana tabacum* (tobacco) leaf extract is effective against *Staphylococcus aureus* bacteria in vitro (Syat 1990). This tends to support the use of tobacco leaves in treating wounds.**
- 6 The remedy has been scientifically validated as effective to treat the**

problem in the livestock species in question. Relevant references are given under the corresponding plant name in the Glossary of medicinal plants section in the General information manual.

Dosages and preparation methods in indigenous practice are often imprecise and vary widely between individuals and regions. The dosages and methods given are those that, according to the professional judgement and experience of the workshop participants, are most suitable, are easy to prepare and are likely to be effective. The workshop participants and IIRR have made every attempt to ensure that the remedies are effective and are not harmful. However, they cannot guarantee this or be held liable for problems arising from these practices.

Unless noted to the contrary, all dosage quantities for treatments are for single dosage applications, in other words, each treatment should be prepared at the time of application according to the quantities specified. Remedies for ruminants are generally stated in terms of dosages for adult cattle or buffaloes. It is important to use appropriate dosages: for instance, a dose for an adult cow could kill a goat; on the other hand, a dose suitable for a goat may have no effect on a cow.

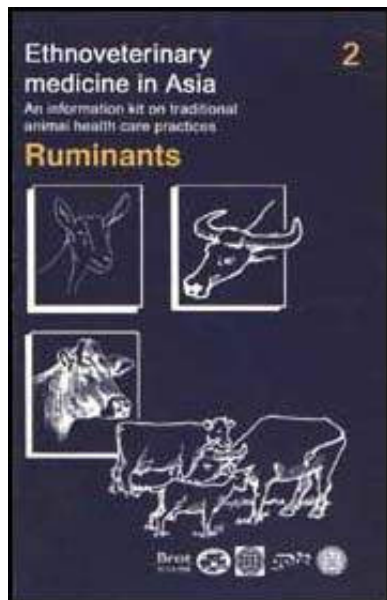
Where possible, simple measurements (handful, cup, etc.) have been given for ease of use by field practitioners. The General information manual contains a guide to commonly used weights and measures. More detailed measurements (milliliters, etc.) are also given to allow a practitioner to be as precise as the particular conditions may allow.

@ This symbol highlights precautions to heed when using a treatment.

This symbol highlights reminders.

*** This symbol marks diseases that can affect humans.**

All references used in this manual are listed in the References section in the General information manual.



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-  **Tick infestation)**
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Lack of appetite

Symptoms

- **Weight loss.**
- **Tiredness.**
- **Lack of energy.**
- **Dullness and listlessness.**

Causes

- **Low quality feed.**
- **Overworked animal.**
- **Hot weather.**
- **Irregular feeding time. Infectious diseases.**
- **Wounds.**
- **Worms.**
- **Stomach trouble.**
- **Stress.**
- **Fever.**

Prevention

In the dry season, when the fodder quality is low, Thai farmers give this supplement as an appetizer.

1. Pound and grind together 5 kg mature Terminalia chebula fruits, 5 kg mature Phyllanthus emblica fruits and 600 g salt.

2. Put the mixture in a big container.

3. Pour 15 liters of bovine urine over the mixture.

4. Ferment (i.e., let stand) for 20 days.

5. Once fermented, drench the animal with 600 ml once a day until it regains its appetite. (Northeast Thailand 1,2,3,4)

Treatment

Use any of these practices.

- **Gently rub the animal's tongue with a stick or an iron bar to stimulate salivation.**
- **Change the feed.**
- **Mix 500 ml juice of tamarind fruit pulp with 10 g dried Terminalia chebula fruit. Feed this to a large ruminant once a day until it regains appetite. For a small ruminant, use 200 ml tamarind pulp juice.**



Animal's treatment

- **Mix together 60 g each of powdered ginger, powdered fennel (*Foeniculum vulgare*) seeds, brown sugar and 20 g black salt. Take enough of the mixture on your finger and rub on the animal's tongue. Do this every day until the animal regains appetite. (India. 1, 2, 3, 4)**
- **Pound together 10 g salt and 10 g *Trachyspermum ammi* seeds. Mix with 20 g molasses and feed to the animal twice a day for 2-3 days. (India. 1, 2, 3, 4)**
- **Grind together 10 g salt and 10 g *Trachyspermum ammi* seeds. Mix with ¼ liter coconut water. Drench twice a day for 2-3 days. (India. 1, 2, 3, 4)**
- **Drench ½ liter buttermilk twice a day for 2 days. (India. 1, 2, 3, 4)**
- **Mix 1 tablespoon soy sauce, 100 ml water and 50 g shrimp paste. Feed the animal once a day for 3 days. (Indonesia. 1, 2)**

To make the animal gain weight

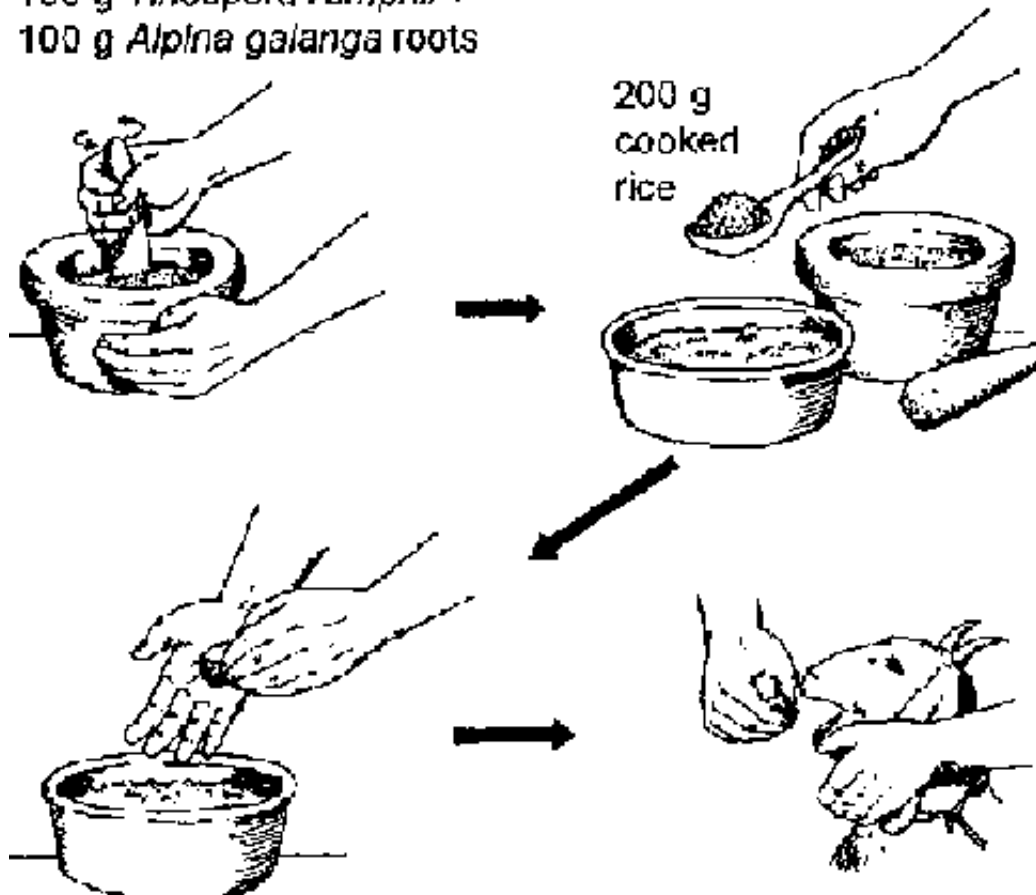
Mix 1 handful each of fresh *Tinospora rumphii* vine, *Cassia siamea* leaves and *Morinda citrifolia* leaves, the grated meat from 1 mature coconut and a handful of salt in 10 liters of water. Let stand for 2 nights. Feed about 1 liter of this mixture to the animal every other morning. After feeding, give lots of water. (Thailand. 1, 2)

To make the animal active

Pound and grind together 100 g *Tinospora rumphii* vine and 100 g galangal (*Alpinia galanga*) roots. Mix with 200 g cooked rice. Make into a ball. Feed this to

the animal once a day for 3 days. (Thailand. 1, 2)

100 g *Tinospora rumphii* +
100 g *Alpinia galanga* roots

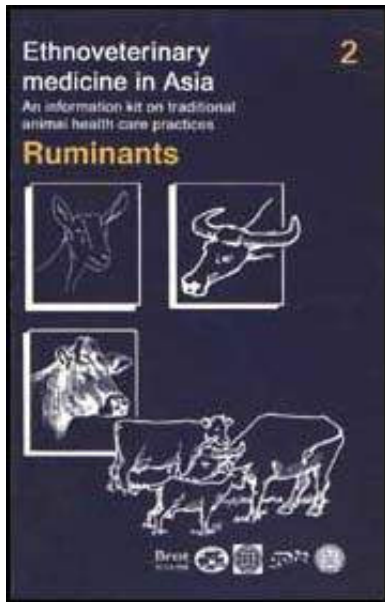



















Cooking treatments for animals











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Fever

Symptoms

- **Body feels hot.**
- **Thirst: the animal drinks a lot of water.**
- **Animal does not urinate as much as usual.**
- **Hairs are raised.**
- **Appetite is decreased.**
- **Eyes are not shining (dull).**
- **Nose is dry.**

Feel the animal's ear. If the ear is very hot, the animal is sick and needs treatment.



Detect fever by holding the base of the ear.

Causes

Fever can occur during sudden changes in weather. Young animals are more susceptible.

Fever is caused mainly by viruses, bacteria or protozoa. It may also be due to sunstroke or poisoning. If the animal has any of the symptoms below, it may have one of the following diseases. Consider consulting a professional (a local expert development officer or veterinarian).

- **Bloody, foul-smelling diarrhea (possibly rinderpest).**
- **Difficulty in breathing (pneumonia); if with snoring sound and bloat (hemorrhagic septicemia)**
- **Lameness, difficulty in eating (foot and-mouth disease)**
- **Very high fever, swelling all over the body (anthrax).**
- **Lameness, swelling of muscles in the thigh and shoulder (black quarter).**
- **Swelling of udder (mastitis)**

- **Red-colored urine (babesiosis).**
- **Groaning and grunting when moving, weakness, tiredness (lasts only 3 days) (ephemeral fever).**
- **Boils filled with water on body (pox).**



Detecting fever

Prevention

- **Provide clean drinking water. Clean the surroundings.**
- **Provide fresh, clean food. Protect animals against bad weather.**
- **To prevent sunstroke, do not tie or graze the animals under the hot sun.**

Treatments

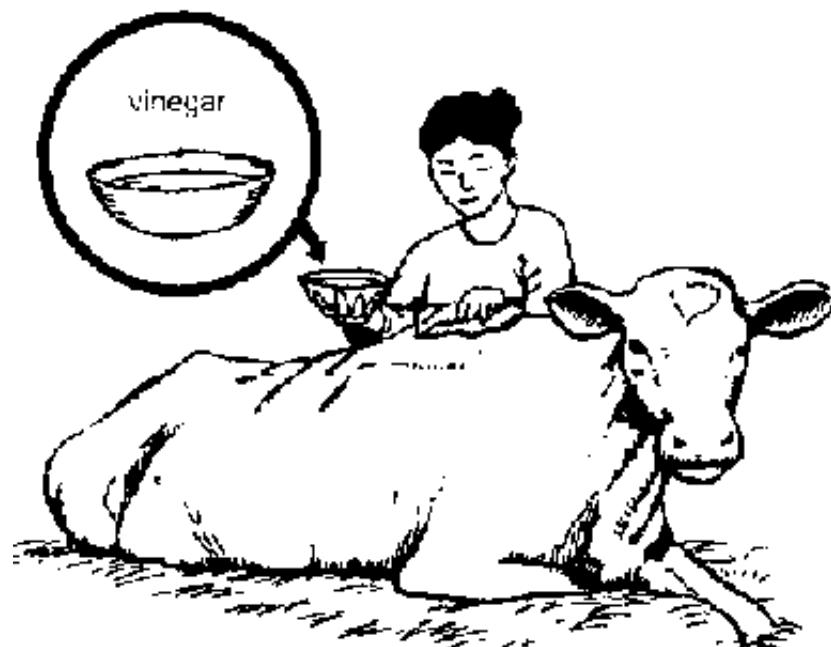
Any of the following treatments will help to reduce the fever. The dosages below

are for cattle and buffaloes. Use half of the quantities for sheep, goats and calves. Use one quarter of the amounts for lambs and kids. Continue giving the treatment to keep the fever under control.

- **Mix about 10 g of *Swertia chirata* (whole plant) with 100 g of molasses to make a thick paste. Apply the paste to the tongue and the roof of the mouth twice a day. (India. 1, 2, 3, 5)**
- **Prepare a paste of the root of *Picrorhiza kurrooa* and molasses as above. Use the same amounts and in the same way as above. (India. 1, 2, 3, 5)**
- **Boil a handful of *Tamarindus indica* leaves and ¼ kg of fruit pulp in ½ bucket of water for 15 minutes. Collect the fluid and give to the animals as the only source of drinking water. (Indonesia. 1, 2)**
- **Boil a handful of *Eucalyptus globules* leaves in 1 liter of water for 15 minutes. Give 1 liter as a drench twice a day. (India. 1, 2, 3, 4)**
- **Boil a handful of fresh neem leaves in 1 liter of water for 15 minutes. Give this amount as a drench twice a day. (India. 1, 2, 3, 4)**
- **Boil two handfuls of *Vitex negundo* leaves for 15 minutes in 1 liter of water. Give 1-2 cups of the liquid 3 times a day as a drench. (India, Philippines. 1, 2)**
- **Sponge animal with vinegar all over the body as often as possible. (Philippines. 1, 2)**
- **Boil a handful of rambutan (*Nephelium lappaceum*) leaves and bark in 3 liters of**

water for 30 minutes. Give 1 liter 3 times a day as a drench.

- **Boil ½ g of the bark or wood of stems or node of *Gardenia jasminoides* in 5 liters of water for 15 minutes. Drench 2 liters per day, twice a day for 5 days.**



Sponge animal with vinegar

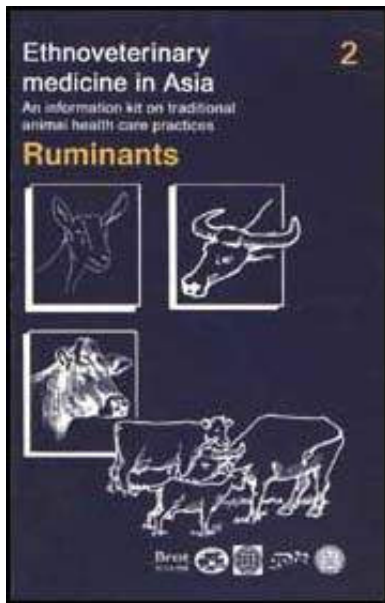
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Coughs and colds

Coughs and colds are diseases of the lungs and the respiratory passage.

Symptoms

- **Coughing.**
- **Sneezing.**
- **Watery eyes.**
- **Watery discharge from the nose, which later becomes yellow in color.**
- **Loss of appetite.**
- **Body temperature is higher than in a normal animal (fever).**
- **Difficulty in breathing.**



Symptoms of coughs and colds

Causes

- **Moist conditions in the animal housing because of poor lighting and ventilation.**
- **Overcrowding of animals.**
- **Allergic reactions.**
- **Lung parasites.**
- **Breathing in dusty food particles.**
- **Infectious diseases.**
- **Foreign particles, irritants or oil in the respiratory passage.**

Prevention

- **Avoid overcrowding, feeding of dusty feeds and exposure to rain or bad weather, especially for young animals.**

Treatment

Any of the following can be used to treat coughs and colds:

Fomentation

Fresh Adhatoda vasica leaves.

Fresh Moringa oleifera (drumstick) leaves.

Fresh Gmelina arborea leaves.

Fresh Curcuma domestica (whole plant with roots).

Chop 5 handfuls of each of the ingredients into small pieces. Mix the ingredients together and divide into 3 parts. Put each part into a plate-sized cloth and tie the cloth to make a pouch. Warm the pouches with steam. Put each warm pouch on the animal's chest for 20-30 minutes, until that pouch has cooled. Then replace it with another warm pouch. Keep the other two Douches warm to allow continuous treatment. Do this twice a day for 2 days. This is best done early in the morning and late in the afternoon. (Sri Lanka. 1, 2, 3, 4)



Boiling a treatment against coughs and colds

- **Apply 300 ml of Mimusops elonga seed oil all over the animal's body, especially on the chest. Keep the animal near the fire so that it is warm. Heat a gunny sack, towel or any absorbent cloth above the fire (not so near as to burn it). Put the sack over the chest of the animal and keep it there for 20-30 minutes. Repeat this twice a day for 2 days. (India Sri Lanka. 1, 2, 3, 4)**



Apply the fire

- **Mix 250 ml of vegetable oil with 50 g of camphor powder to make camphorated oil. Rub this on the chest. Do this continuously for 5 minutes or until you can feel the warmth of the chest. Do this twice a day for 2 days. (India. 1, 2, 3, 4, 5)**

Oral treatment

The dosages given below are for adult cattle and buffaloes. Use one-third to half the dosage for sheep, goats and calves. Give the remedy for a maximum of 10 days or until symptoms disappear (unless the duration is stated below).

- **Brassica integrifolia (raw seed).**
- Garlic bulb.**
- Black pepper (Piper nigrum) seed.**
- Moringa oleifera (stem bark).**

Ginger rhizome.

Finely pound a handful of each of the ingredients, mix and make a small bolus. Put 4-5 bolus inside the animal's mouth twice a day for 3-4 days. Make sure the animal swallows the medicine. (Sri Lanka. 1, 2, 3, 4)

- **Boil 2 handfuls of fresh leaves of *Tamarindus indica* with 1 liter of water for 5 minutes. Drench with 1 liter of the liquid, 3 times a day for 3 days. (Philippines. 1, 2)**
- **Pound 500 g of fresh *Erythrina indica* leaves and mix with 300-400 ml (1 big glass) of water. Drench all of this amount twice a day for 2 days. (Indonesia. 1, 2)**
- **Mix 5 g of *Curcuma domestica* (dried rhizome) powder with just enough brown sugar to bind the powder. Feed this as a paste to the animal twice a day for 10 days. (India. 1, 2, 3, 4, 5)**
- **Mix 5 g of powder of each of the following ingredients:**

***Curcuma domestica* (dried rhizome).**

***Ocimum sanctum* or *Ocimum basilicum* (dried leaves).**

***Adhatoda vasica* (dried leaves).**

Ginger (*Zingiber officinale*/zerumbet) (dried rhizome).

Add 2 cups of water, mix and drench at once, 2 times a day for 10 days. (India. 1, 2, 3, 4, 5)

- **Separately grind 1 whole dried plant of *Glycyrrhiza glabra* and dried leaves of**

Ocimum sanctum, Adhatoda vasica and Curcuma domestica rhizome. Take 10 g of each powder and mix them with enough brown sugar to bind the powder. Feed as a paste to the adult animal 2 times a day for 5-10 days. (India. 1, 2, 3)

• **Mix 10-15 g of dried Alpinia galanga rhizome powder with a little brown sugar to make a paste. Feed as a paste or apply the paste to the tongue of the animal, twice a day for 5 days. (India. 1, 2, 3, 5)**

• **Grind 5-10 g of dried rhizome of Zingiber officinale or Zingiber zerumbet to powder. Mix with a small amount of brown sugar to make a paste. Feed this twice a day. (India. 1, 2, 3, 4, 5)**

• **Boil 10 g of either dried or fresh Adhatoda vasica leaves with 2 liters of water for ½ hour. Drench with 500 ml of the liquid twice a day for 10 days. (India. 1, 2, 3, 4, 5)**

• **Grind 5 - 10 g of dried Ocimum sanctum leaves to powder. Mix with a little brown sugar and apply paste to the tongue 2-3 times a day. (India. 1, 2, 3, 4, 5)**

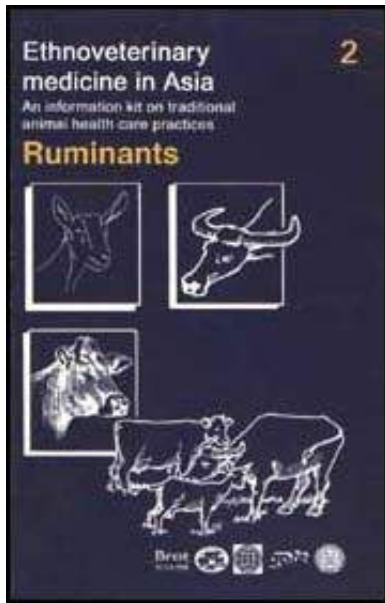
• **Mix the juice of 1 lemon (Citrus medica) fruit with a pinch of salt and apply to the tongue of the animal twice a day. (Thailand. 1, 2, 3)**






























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 **Collaborating organizations**



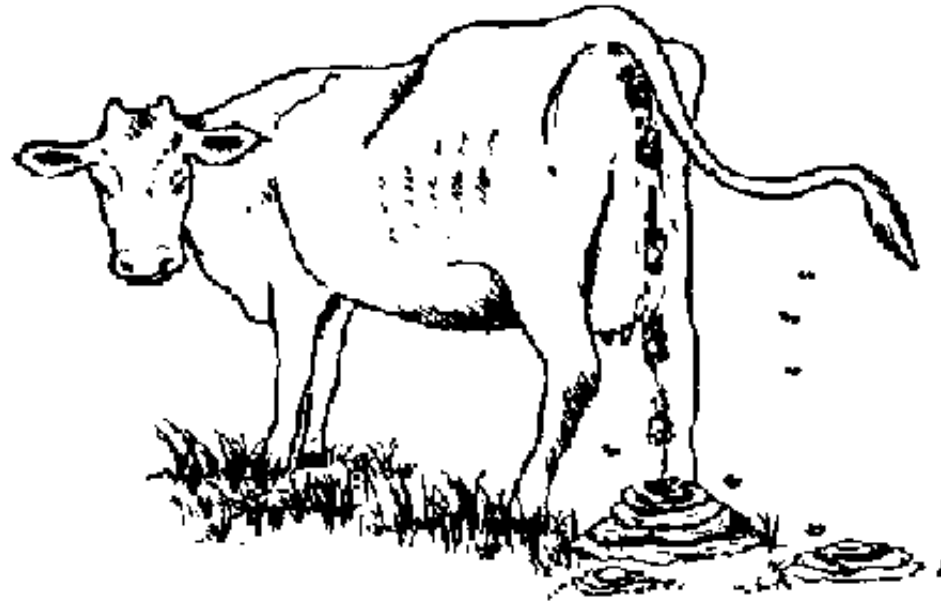
-  **Participants and workshop staff**
-  **How to use this manual**
-  **Lack of appetite**
-  **Fever**
-  **Coughs and colds**
-   **Diarrhea**
-  **Dehydration**
-  **Bloat**
-  **Constipation**
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-  **Internal parasites: Stomach and gut worms**
-  **Liverflukes**
-  **Tick infestation**
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-  **Lice**
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-  **Sprains**

-  **Difficulty in urinating**
-  **Housing**
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-  **Pregnancy and birthing**
-  **Care of mother animals after birthing**
-  **Care of newborn**
-  **Udder infection**
-  **Decreased milk flow**

Diarrhea

Symptoms

- **Defecation more frequent than normal.**
- **Loose feces that sometimes contain blood, mucus or both.**
- **Dry skin.**
- **Hindquarters are soiled.**
- **Animal stops chewing cud.**
- **Animal has dull and sunken eyes and does not move energetically.**



Diarrhea

Causes

- Sudden change in diet (especially from dry fodder diet to green fodder).
- Intestinal parasites like amoeba.
- Bacterial and viral diseases.
- Contaminated water.
- Overeating.

Prevention

- Good hygiene and nutrition.
- Proper husbandry practices such as giving clean feed and water, keeping animal quarters and surroundings clean, etc.

- **Do not graze the animal immediately after a rain or too early in the morning before the dew has dried.**
- **Do not provide drinking water immediately after giving legumes and green fodder as feed.**
- **Deworm the animals regularly. See Internal parasites, page 38.**
- **Vaccinate animals against rinderpest in areas where it is seasonally endemic.**

@ Caution

- **Watch out for rinderpest—bloody, foulsmelling, shooting diarrhea with high fever that affects many animals in the village. (See Infectious diseases).**
- **If there is chronic diarrhea with wasting away and no response to treatment, seek professional help.**

Treatment

Provide a soft, pulpy diet to animals with diarrhea. It is necessary to make the animal drink extra liquid to replace the liquid lost in the diarrhea. Diarrhea that lasts for 2 to 3 days may cause dehydration. This can lead to shock and then death. It is, therefore, necessary to make the animal drink more liquid.

Use any of the following drenches. The dosages of the treatments given below are for adult cattle or buffaloes.

Use half the amounts for calves, goats and sheep. Further drenches are described in Dehydration, page 18.

- **Dissolve 1 teaspoon of salt and 4 teaspoons of sugar in 1 liter of water. Drench 2-3 times a day as needed. Continue giving the treatment for as long as the diarrhea lasts. (India. 1, 2, 3, 4, 5)**
- **Boil 1 handful of tea leaves in 1 liter of water. Strain, and add ½ handful of ground ginger rhizome to the liquid. Drench twice a day for 3-4 days. (India. 1, 2, 3, 4, 5)**
- **Grind ½ handful of fresh ginger rhizome and ½ handful of bishop's weed (Trachyspermum ami) seeds. Add this mixture and a handful of tea leaves to 1 liter of water and boil. Cool. Drench half of the amount in the morning and half of the amount in the evening. Repeat the next day until the diarrhea stops. (India. 1, 2, 3, 4, 5)**
- **Give the water from cooked rice mixed with 1 g of dried ginger rhizome powder to the animal to drink. Repeat 2 times a day. Give half the quantity for sheep and goats. (India. 1, 2, 3, 4, 5)**
- **Drench 500 ml to 1000 ml of young coconut water twice a day until the diarrhea stops. (Philippines, Thailand. 1, 2, 3)**

Some treatments to help stop diarrhea are described below. As before, use half the dosages given below for calves, sheep and goats. Continue the treatment for as long as the diarrhea lasts.

- **Mix 1 handful each of bishop's weed (*Trachyspermum ammi*) seeds, dried or fresh ginger rhizome and cumin**

(*Cuminum cyminum*) seeds with 1/2 handful fenugreek (*Trigonella foenum-graecum*) seed powder. Mix with 50 g brown sugar to make bolus and feed by mouth twice a day for 2-3 days. (India. 1, 2, 3, 4)

- **Boil 1/2 kg of fresh guava (*Psidium guajava*) leaves in 3 glasses of water. Drench twice a day. (Thailand. 1, 2, 3, 4, 5)**

- **Boil about 20 fresh star apple (*Chrysophyllum cainito*) leaves in 2 cups of water. Drench 3 times a day for 1-3 days. (Philippines. 1, 2, 3, 4)**

- **Grind coconut shell charcoal to a powder. Mix 1 cup with 500 ml of water. Drench 3 times a day for 3 days. (Philippines. 1, 2, 3, 4)**

- **Mix 5 to 10 crystals of potassium permanganate in 1 liter of water. Drench twice a day. (India. 1, 2, 3, 4)**

- **Drench the animal with any of the following ingredients in the amounts indicated, mixed in 300 to 400 ml of water: powdered chalk (4 g), kaolin earth (5 g), or potassium aluminum sulfate crystals (0.8 g).**

- **Crush 15 g each of the young fruits and roots of *Momordica charantia* to obtain the juice. Mix the juice into 1 liter of young coconut water and drench once a day for 3 days. (Philippines. 1, 2, 3, 4, 5)**

- **Prepare a decoction of 10 to 15 leaves of *Psidium gunjava* in 1 liter of water.**

**Divide the liquid in 3 equal doses and give 3 doses per day for 5 days.
(Philippines. 1, 2, 3, 4, 5)**

Some further treatments to stop diarrhea are presented in the following table. All plant parts used in the treatments are dried and ground to powder form.

Mix the dosage indicated with 300 to 400 ml of water and drench with this amount twice a day for 3-5 days or as long as the diarrhea lasts.

Scientific name	Common name	Parts used	Dosage
Acacia catechu	Catechu	Sap lumps	0.8 g
Aegale marmelos	Bael fruit	Dried, ripe fruit	1.0 g
Cyperus rotundus	Nut grass	Dried roots	1.0 g
Holarrhena antidysenterica	Kurchi	Dry seeds and bark	3.0 g
Veronica anthelmentica	Purple	Dry seeds	3.0 g

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 **(introduction...)**

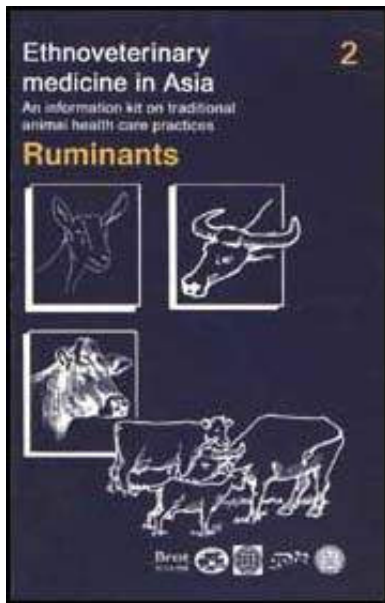
 **Collaborating organizations**
























 **Participants and workshop staff**







 **How to use this manual**

 **Lack of appetite**

 **Fever**

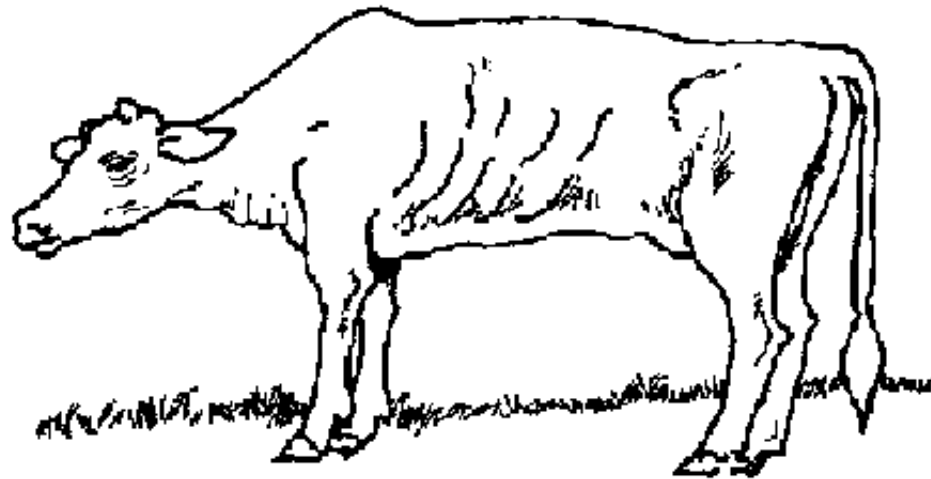


-  **Coughs and colds**
-  **Diarrhea**
-  **Dehydration**
-  **Bloat**
-  **Constipation**
-  **Poisoning**
-  **Internal parasites: Stomach and gut worms**
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Dehydration

When an animal loses more water than it is able to take in, its body will become dehydrated.



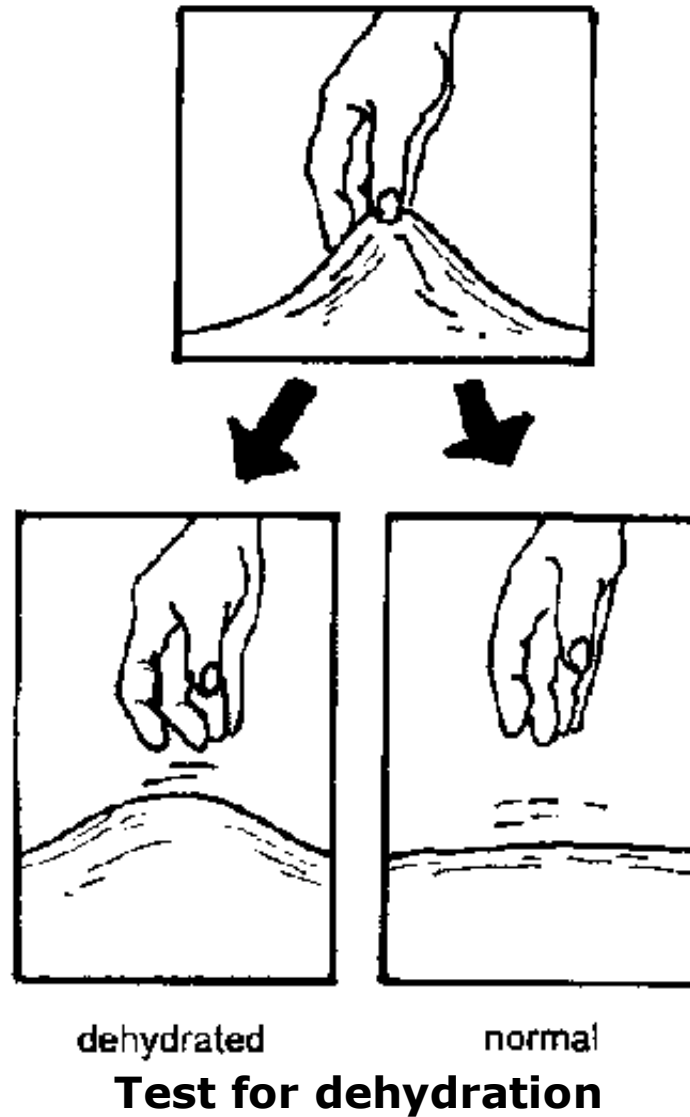
Dehydration

Symptoms

- **Eyes are sunken.**

- **The skin is dry, wrinkles and is hard to stretch.**
- **The animal is very thirsty and very weak.**
- **The feces are dry.**
- **The animal suffers from constipation: there are less feces than usual.**
- **It urinates less than usual. The urine has a dark color.**

An easy test for dehydration: Raise the skin on the neck between your finger and thumb. If the skin returns to the normal position only slowly, the animal is dehydrated.



Causes

- **Diarrhea.**
- **Heat stress.**
- **Insufficient drinking water.**

- **Diseases that last a long time.**
- **Bleeding due to large injuries.**
- **Diseases in the urinary tract.**
- **Severe burns from fire or chemicals.**
- **Inability to drink water: something blocks the passage of food.**

Prevention

- **Always give the animal enough drinking water.**
- **Grazing areas should be near to a source of water.**
- **Ensure that the immediate surrounding of the animal is clean.**
- **Avoid keeping the animal in the sun for a very long time.**
- **Avoid any cause of diarrhea. See Diarrhea, page 13.**

Treatment

Before using any treatment, find out what causes the dehydration. See Diarrhea.

The dosages below are for adult cattle and buffaloes. Use one-third or half of this amount for calves, sheep or goats.

To replace the lost liquid in the body, use any of the following remedies:

- **Drench the adult with 2-3 liters of young coconut water 23 times a day until symptoms have disappeared. Varieties of coconut with yellow nuts are preferable. (India, Sri Lanka, Philippines. 1, 2, 3, 4)**
- **Mix 1 teaspoon of salt with 1 liter of the water left after washing rice (or**

the water left after cooking rice). Drench 1-3 liters of such a mixture 2-3 times a day until the symptoms disappear. (Indonesia. 1, 2)

- **Take 1 handful of any kind of tea leaves and pour 2 liters of boiling water on them. Add a handful of sugar or brown sugar. Let it cool and drench all this mixture 2-3 times a day for 3 days. (India. 1, 2, 3)**

- **Take 1 handful of each of the following parts of Aegle marmelos: young fruit, leaves, flowers, root, stem and bark. Chop and put in 2 liters of water. Boil for ½ hour. Drench adult cattle and buffaloes with 1-2 liters twice a day for 2 days. Drench calves, sheep and goats with ½ liter of mixture twice a day for 2 days. (Sri Lanka. 1, 2,3, 4)**

- **Pound 10 fresh Mitragyna speciosa leaves and mix with 1 liter of water. Drench with the liquid 2-3 times a day until the symptoms disappear. (Thailand. 1, 2, 4)**

- **1 kg Careya sphaerica bark.**

- **1 kg Xylia kerii bark.**

- **1 kg Sesbania grandiflora bark.**

Boil the 3 types of bark together in 3 liters water. Drench the adult buffalo or cattle with 2-3 liters of the liquid 2-3 times a day for 4 days. (Thailand. 1, 2, 3, 4, 5)

- **Dissolve 2 teaspoons of salt, 1/2: teaspoon of baking soda (if available) and 4 teaspoons of sugar in 1 liter of water. Drench adult cattle and buffaloes with 2-3 liters of the solution 2-3 times a day. Drench calves,**

goats and sheep with ½-1 liter 2-3 times a day. Continue treatment until the symptoms disappear. (Thailand. 1, 2, 3)

