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Assisting the Beef Cow at Calving Time

W. L. Singleton and L. A. Nelson, Animal Sciences Department

In the U.S., 6 to 10 percent of all calves born in beef cow herds die at or soon after birth. Approximately half of those deaths are due to calving difficulty (dystocia). This multi-million dollar annual loss is three times that resulting from abortions and second only to losses from cows failing to conceive.

Calving difficulty has received much attention in recent years, largely because of the mating of larger European breeds of bulls to British breeds of cows. Increased calving problems are also being encountered within purebred breeds, because genetically large bulls are often mated to cows of only average size.

The purpose of this publication is to acquaint cattle producers with calving management principles that will help minimize calf loss in their herds. Discussed are: causes of calving difficulty, stages in the birth process, the problems that can crop up in each stage and how to handle them, and an outline of basic steps in calving assistance.

FACTORS CAUSING CALVING DIFFICULTY

About 80 percent of all calves lost at birth are anatomically normal. Most of them die because of injuries or suffocation resulting from difficult or delayed parturition (calving). Factors contributing to calving problems fall into these three main categories—calf effects, dam effects and fetal position.

Calf Effects

Heavy birth weights account for most of the problems related to the calf. Birth weights are influenced by: breed of the sire, bull within a breed, sex of the calf, age of the dam and, to a slight degree, nutrition of the dam.

Dam Effects

Several factors associated with the cow influence dystocia, the major ones being her age and pelvic size.

Age. Two-year-old heifers require more assistance in calving than do cows, because they are usually structurally smaller.

Pelvic area. Pelvic area (birth canal) increases as the female develops to sexual maturity. Thus, a higher proportion of calving difficulty in 2- or 3-year-old dams is due to smaller pelvic openings. Heifers and mature cows with small pelvic areas are likely to require assistance at calving. However, even heifers with large pelvic areas may need help.

The calf's birth weight and cow's pelvic area have a combined effect on dystocia. Many heifers giving birth to calves weighing over 80 pounds will have difficulty, even if they have large pelvic areas. Two-year-old heifers tend to have either a pelvis too small or a calf too large to allow them to deliver without assistance. Therefore, calving problems could be reduced by decreasing birth weight through bull selection or increasing pelvic area by selecting the larger, more growthy heifers.

Fetal Position at Birth

About 5 percent of calves are in abnormal positions at birth, such as foreleg or head turned back, breech or rear end position, sidewise or rotated, etc. (Figure 1). It requires the assistance of a veterinarian or experienced herdsman to position the fetus correctly prior to delivery. If fetal position cannot be corrected, the veterinarian may have to perform a caesarean section.
STAGES OF CALVING (PARTURITION)

Normal calving can be divided into three general stages—preparatory, fetal expulsion, and expulsion of the placenta or afterbirth. The time interval of each stage varies among types and breeds of cattle and among individuals of the same breed. Although the exact stimulus that initiates parturition is unknown, it does involve hormonal changes in both dam and fetus as well as mechanical stimulation and increased pressure in the uterus.

A general understanding of the birth process is important to proper calving assistance and, therefore, is presented here and summarized in Table 1.

Stage 1. Preparatory (2-6 hours)

During pregnancy, the fetal calf is normally on its back. Just prior to labor, it rotates to an upright position with its forelegs and head pointed toward the birth canal (Figure 2). This position provides the least resistance during birth. Toward the end of gestation, the muscular lining of the dam’s uterus increases in size, which aids in delivery of the calf.

In the preparatory stage, the cervix dilates and rhythmic contractions of the uterus begin. Initially, contractions occur at approximately 15-minute intervals. As labor progresses, they become more frequent until they occur every few minutes. These contractions, much like swallowing, begin at the back of the uterine horn and continue toward the cervix, tending to force the fetus outward. Any unusual disturbance or stress during this period, such as excitement or even movement, may inhibit the contractions and delay calving.

At the end of the preparatory stage, the cervix expands allowing the uterus and vagina to become a continuous canal. A portion of the placenta (water sac) is forced into the pelvis and ruptures. Normally, fluid then escapes to lubricate the birth canal. This portion of the water sac usually hangs from the vulva until Stage 2.

Stage 2. Delivery (1 hour or less)

This stage begins when the fetus enters the birth canal, and usually occurs while the cow is lying down. Uterine contractions are now about every 2 minutes and are accompanied by voluntary contractions of the diaphragm and abdominal muscles.

The calf’s head and forelegs surrounding by membranes now protrude from the vulva. After the head is exposed, the dam exerts maximum straining to push the shoulders and chest through the pelvic girdle. Once the shoulders have passed, the abdominal muscles of the calf relax, and its hips and hind legs extend back to permit easier passage of the hip region.

The calf is normally born free of fetal membranes (placenta), because they remain attached to the cotyledons or "buttons" of the uterus until after the calf is born. This insures an oxygen supply for the calf during birth. Upon passage through the vulva, the umbilical cord generally breaks, and the lungs become functional.

Delivery is normally completed in 1 hour or less. Special assistance is warranted if this stage goes beyond 2 to 3 hours.

Table 1. Stages of Calving.

<table>
<thead>
<tr>
<th>Stage and time</th>
<th>Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparatory</td>
<td>1. Calm rotates to upright position.</td>
</tr>
<tr>
<td>(2 to 6 hours)</td>
<td>2. Uterine contractions begin.</td>
</tr>
<tr>
<td></td>
<td>3. Water sac expelled</td>
</tr>
<tr>
<td>Delivery</td>
<td>1. Cow usually lying down</td>
</tr>
<tr>
<td>(1 hour or less)</td>
<td>2. Fetus enters birth canal</td>
</tr>
<tr>
<td></td>
<td>3. Front feet and head protrude first</td>
</tr>
<tr>
<td></td>
<td>4. Calf delivered</td>
</tr>
<tr>
<td>Cleaning</td>
<td>1. Cotyledon-corneal (button) attachments relax</td>
</tr>
<tr>
<td>(2 to 6 hours)</td>
<td>2. Uterine contractions expel membranes</td>
</tr>
</tbody>
</table>

Figure 1. Abnormal positions of the calf for delivery.

Figure 2. Normal position of the calf just prior to delivery.
Stage 3. Cleaning (2-8 hours)

The placenta is expelled by continued uterine contractions after its separation from the maternal cotyledons attached to the uterus. The caruncle cotyledon, or button attachment between uterus and placenta, relaxes and separates. Cows normally expel the placenta within 2 to 8 hours.

PREPARING FOR CALVING ASSISTANCE

Normal delivery in cattle should be completed within 2 hours after the water sac is expelled. If prolonged, the calf may be born dead or with permanent brain damage because of lack of oxygen. Since timing is so important to providing proper assistance, frequent observations are a must. Assisted deliveries should not be attempted without proper preparation of facilities and equipment. A calving equipment checklist is given in Table 2.

Also, check with your veterinarian for advice on when to assist the cow alone and when to call him. Since cervical dilation is completed in Stage 2, assistance can be given too early. But much more serious—since final dilation is quite rapid, assistance is too often given too late.

STEPS IN CALVING ASSISTANCE

1. Determine the extent of cervical dilation by palpation. It should be dilated enough to allow easy passage of the fetus.

2. Determine the position of the fetus within the first hour of labor (Figures 1 and 2). This allows sufficient time to correct the more simple problems or to summon the necessary professional help if warranted.

3. Examine the size of the calf relative to the birth canal. A large calf forced through a small pelvic opening may result in death of the calf and injury (including paralysis) to the cow. If this examination can be made before the head and front feet are in the pelvis, the opportunity for successful caesarean section still exists.

4. If the examination indicates a dry fetus and birth canal, additional lubrication is needed. Use either a commercial obstetrical soap or make a suitable lubricant by dissolving ivory soap in hot water. Keep the soapy water from becoming contaminated.

5. Attach the obstetrical (pulling) chains to the front legs of the calf, placing the loop of each chain around each leg. Then slide the chains up on the cannon bone 2-3 inches above the ankle joints and dew claws, and half-hitch it below the ankle (Figure 3). Do not attach the chain by making a single loop around both front legs, because of the danger of breaking one or both legs. For the same reason, make sure the chains pull from the bottom of the leg (dew-claw side).

6. Attach the obstetrical handles and pull gently, making sure the chains have not slipped. Although some calves can be delivered by pulling both legs evenly, it’s usually best to alternately pull on one leg and then the other a few inches at a time (Figure 4).

Once the legs are “walked out” in this manner, the shoulders are allowed to pass through the pelvic

Table 2. Calving Equipment Checklist.

| Clean, lighted maternity pen (10' x 10') | Tattoo equipment |
| Pulling chains & handles | Urine blow |
| Disinfectant | Scour vaccine |
| Lubricant | A D & E |
| Syringe & needles | Copy of Purdue Ext |
| Antibiotics | Publication AS-405 |
| Scour blow & gun | Flashlight |
| Record book | Optional |
| Halter & lariat | Dehorning paste |
| Iodine | Bucket heater |
| Piece of hose 18" long | Respirator |
| Paper towels | Epinephrine |
| Bucket & scrub brush | Scales |
| Ear tags & applicator | Pulling jack |
opening one at a time. If the shoulders should happen to
“lock” at the opening, apply traction to the calf’s head
both to reduce its compaction against the sacrum (or
top of the birth canal) and to reduce the dimensions of
the shoulder and chest region.

7. Once head and shoulders are exposed, pull the
calf downward at a 45° angle, or nearly parallel with the
rear legs of the cow.

8. Chance of uterine or cervical lacerations and
tears is greatest when the calf’s head and shoulders
come through the birth canal. Such damage may lead to
infections and future reproductive problems. Since
pressure dilates the birth canal, if traction is applied
gradually, damage can usually be prevented. Gradual
application of traction also helps prevent damage to the
cow if assistance happens to be given too early,
because very slow traction will not interfere with normal
dilation of the cervix.

9. “Hip lock” can be a problem serious enough to
cause loss of the calf. If it happens in a cow lying down,
simply push the fetus back a short distance, then apply
traction to the front legs in a direction toward the cow’s
udder flank. This rotates the calf enough so one hip bone
goes through the pelvic opening ahead of the other.
Another obstetrical chain could also be placed around
the calf behind its shoulders; but again, traction should
be gentle so as not to injure the back or spinal column.

10. All posterior (breech) presentations should be
considered an emergency, because the umbilical cord
is cramped between the fetus and pelvis early in the
delivery. This means blood circulation is slowed, and the
fetus will die or sustain brain damage unless delivery is
rapid.

Attach the obstetrical chains above the hocks; and
be sure the birth canal is adequately lubricated, since
extraction is against the normal direction of hair growth.
Breech delivery is usually eased by alternating traction
on the rear legs and by rotating the fetus about an eighth
of a turn to take advantage of the greatest diameter of the
cow’s pelvis. If delivery proves extremely difficult, a
caesarean section is probably necessary and should
not be delayed.

11. Only a veterinarian or experienced herdsman
should use mechanical calf pullers. If used incorrectly,
permanent damage can occur to both calf and cow.

12. Correcting abnormal presentation other than a
leg or head turned back also usually requires
professional help. For instance, a fetus which is upside
down may be such because either the uterus or fetus is
rotated.

STARTING THE CALF

Once delivered, clear any mucus from the calf’s
mouth and throat with your hand. Then, if necessary,
stimulate the calf to breathe by either rubbing it briskly,
tickling its nose with straw, slapping it with the flat of the
hand, or suspending it briefly by its rear legs to allow
drainage of fluid from the lungs.

Artificial respiration could be applied to the calf as
follows: place a short section of ½-inch garden hose into
one nostril; hold mouth and nostrils shut so air enters
and leaves only through the hose; then alternately blow
into the hose and allow expiration of air. Repeat at 5-
to 7-second intervals until the calf begins to breathe.
Another method is alternate pressure and release on the
rib cage. Commercial respirators are also available and
might be a wise investment in larger herds.

POTENTIAL POST-DELIVERY PROBLEMS

Uterine Prolapse

This is an inversion of the uterus that can occur
when partial vacuum is formed in the uterus. It is
sometimes caused by pulling the calf too rapidly, and
may result in death of the cow if not treated promptly and
correctly.

Always contact a veterinarian for recommendations
and drugs needed for treatment. Cull heifers or cows
that prolapse, because the probability of it happening
again is very high.

Retained Placenta

The placental membranes are normally expelled
within 2-8 hours after birth. Occasionally, they fail to
separate from the uterus. If not treated, the condition
may pose a serious health threat to the cow and cause
problems in re-breeding. The reason for retained
placentas is not known, but high incidence may indicate
a disease problem. They also commonly accompany
multiple births, short gestations and bull calf births.

There are differing opinions among veterinarians as
to the best treatment for retained placentas. Some
prefer removing the membranes by hand when the fetal
and maternal cotyledons are easily separated. Others
prefer using high doses of injectable antibiotics and
uterine boluses. This problem requires good judgment
and can be treated successfully only with drugs and

treatment available through a veterinarian.

SUMMARY OF CALVING MANAGEMENT
RECOMMENDATIONS

1. Observe the herd closely during calving season,
especially first-calf heifers, because they will require the
most assistance.

2. Have proper equipment and facilities available
prior to calving and in working order.

3. Give assistance during delivery or call a
veterinarian when needed. Do not wait more than a few
hours after start of labor to act.

4. Correct any abnormal fetal presentation in the
early stages of delivery.

5. When pulling a calf, loop the chain or rope above
the ankle joint and half-hitch it below the ankle. Apply
traction on one leg at a time to facilitate passage of the
shoulders through the birth canal.

6. Remove mucus from the calf’s nose and mouth
immediately after birth. If the calf does not start to
breathe normally, hold it up by the hind legs and shake it
vigorously, or apply artificial respiration with a short
piece of hose or by alternate pressure and release on the rib cage.

7. Disinfect the navel cord with iodine to prevent infection.

8. Keep birth weight and ease-of-calving records to identify those sires and dams responsible for calving problems. This information is especially important for selecting sires to breed yearling heifers. Also, when possible, cull those females with a history of calving problems and avoid selecting replacement heifers from such cows. Table 3 shows a simple calving-ease scoring system.

### Table 3. Calving-Ease Scoring System.

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No difficulty, no assistance</td>
</tr>
<tr>
<td>2</td>
<td>Minor difficulty, some assistance</td>
</tr>
<tr>
<td>3</td>
<td>Major difficulty, assistance with jack or puller</td>
</tr>
<tr>
<td>4</td>
<td>Caesarean birth</td>
</tr>
</tbody>
</table>

**Sources of Information**

**References**

R. A. Bellows, "Problems at Calving", U.S. Range Livestock Experiment Station, A.R.S., Miles City, Montana.


**Related Publications**

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- "Selection and Management of the Cow Herd" (AS-396).
- "Selection and Management of the Calf Crop" (AS-397).
- "Twenty Ways to Wean More Pounds of Beef" (AS-406).
- "Individual Beef Cow Record" (AS-416).
- "Beef Herd Management Calendar—Spring Calving Program" (AS-414).
- "Beef Cattle Identification Methods" (AS-410).
- "Management and Economics of a Beef Cow Herd AI Program" (ID-100).