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The Cattleman and Dystocia

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There are many factors which contribute to dystocia (calving difficulty). The cattleman should be aware of these factors so he can make sound management decisions and reduce loss. In fact, losses from dystocia extend far beyond death loss in cows and calves. There are significant hidden losses of a more subtle nature. In cows with dystocia at the San Juan Basin Experiment Station, calving interval was increased 13 days, calves were 32 pounds lighter at weaning and 14% more were open than cows with normal calving histories. Data from the Meat Experiment Station at Clay Center indicates the same type of lowered reproductive performance (Table I). It is likely that much of this loss is generated by lack of sanitary calving facilities and handling techniques and is preventable.

Table I

Dystocia and Reproductive Performance at Clay Center

	Normal	Dystocia
Number of cows	1423	466
A.I. Period		
% in heat	74.3	50.9
% conception	69.2	53.6
Total conception	85.3	69.4

There is an insistent need to produce beef more efficiently to compete with other sources of protein. In attempts to meet this challenge extensive crossbreeding programs have been developed by cattlemen, but new problems have been generated. For example, calving difficulty increases when small breeds of cows are bred to bulls which increase calf birth weight, a common practice in crossbreeding programs.

Heredity has an important bearing on the occurrence of dystocia. For example, certain sires produce calves which are associated more often with dystocia than other sires of the same breed in either straight- or crossbreeding programs (Table II). Information on calf size and dystocia is sometimes available on sires which have been used extensively in artificial insemination programs and should be considered when selecting a sire for heifers or small cows. This type of information can also be developed by the cattlemen if careful records are kept and birthweights taken.

Table II
Bull Differences in Dystocia

Angus Bulls	Number calves	% Dystocia
1	29	<u>41</u>
2	30	<u>13</u>
3	31	19
4	25	36
Hereford Bulls		
1	29	34
2	35	<u>40</u>
3	34	24
4	22	<u>14</u>

(Wiltbank)

Certain lines of cattle at the Fort Lewis Experiment Station have more dystocia than other lines, also indicating a hereditary bias. This type of information also can only be developed through careful record keeping systems, but once obtained can be valuable when selecting heifers for replacements.

Table III
Cow Lines and Dystocia

Line	No. Calving	% Dystocia
Brae Arden	408	<u>13.5</u>
Colorado	174	8.0
Don	208	4.3
Monarch	245	<u>11.0</u>
Prospector	259	7.7
Royal	260	<u>12.3</u>
San Juan	229	6.1
Control	212	13.7

(San Juan Basin Experiment Station)

Crossbreeding often increases birthweight and dystocia, especially with selected crosses (Table IV). For example, straightbred Jersey calves had average birthweights of about 51 pounds in work done in England. When bred to Brown Swiss or Simmental, birthweights were increased to about 65 pounds and dystocia increased from near zero to about 10 percent. Certain Charolais bulls crossbred to Jersey cows produced calves with birthweights that averaged 83 pounds and increased dystocia to 13 percent. Within each breed, however, certain bulls decrease birthweights when compared to other bulls of the same or different breed. These bulls should be selected for crossbreeding to smaller breed cows when possible.

Table IV
Crossbreeding and Dystocia in Hereford and Angus Cows

Sire	% Dystocia	Birthweight
Hereford	16	71
Angus	10	68
Jersey	6	62
South Devon	32	76
Limousin	31	79
Simmental	33	81
Charolais	31	80

(Clay Center)

Nutrition management also has a bearing on the occurrence of dystocia. Beef cows should be fed to gain about 100 to 120 pounds during the last three or four months of gestation. This is about the amount they will lose when the calf is born. Heifers which do not have adequate growth before calving may be too small at the time of parturition. Conversely, if heifers are too fat at calving time, dystocia is increased and more calves die during the first week after birth according to work done at Fort Robinson and Miles City (Table V and VI). Some cattlemen have attempted to starve dystocia from their cows

Table V
Nutrition and Dystocia in Heifers

	Number	% Dead At Birth	% Died in 24 Hrs.
Very Fat (Choice or Prime)	22	18	27
Good Condition (Gaining 1 1/4 # Day)	34	9	0
Thin (Loosing 1 # Day)	20	10	0

(Wiltbank)

Table VI
Starvation and Dystocia

Group	Number	% Dystocia	Birthweight
Gaining 1 1/4 # Day	140	36	70 lbs.
Loosing 1/4 # Day	94	33	63 lbs.

(Wiltbank)

once they have become pregnant. This is a faulty management practice (Table VII). Inadequate nutrition can result in debility (rundown condition) of cows and heifers and make them poor obstetrical risks as well as reduce their breeding efficiency following calving. Well-grown heifers will not be free of dystocia, but proper nutritional management can decrease it considerably.

Table VII
Effect of Level of Feeding During the Last Trimester on
80 Angus Heifers and Their Offspring

Parameter	High Feed Level	Low Feed Level
Heifer weight (lb.)*	749	580
Pelvic area (sq. cm.)*	237	227
Weight of Calves		
Early*	56	48
Late*	59	56
Dystocia	6	5

Young, J. S. Aust. Vet. J., 46:1970.

*Differences are significant (P < 0.01).

Both increased age and size of heifers decrease dystocia. Allowing heifers an additional year to grow before calving decreases dystocia (Table VIII) but increases carrying costs, so this cannot be tolerated.

Table VIII
Age Differences in Calving Difficulty and Assistance

Age of Dam (yr.)	No. Calving	Avg. Birth Wt. (lb.)	Assisted Deliveries		
			Normal Presentations (%)	Abnormal Presentations (%)	Total (%)
2 ^a	287	72	43	3	46
3 ^a	158	78	16	6	22
4	465	83	1	2	3

^aFirst-calf heifers.
Bellows, 1966.

The increased heifer or cow size is associated with larger calves, but they also have larger pelvic openings, so calving difficulty is decreased (Tables VIII and IX).

Table IX
Age Differences in Pelvic Area and Body Weight

Age (yr.)	No.	Pelvic Area (sq. cm.)	Body Wt. (lb.)
2 ^a	198	250	813
3 ^a	251	292	1023
4 and 5	75	332	1045

^aFirst-calf heifers.
Bellows, 1961.

About one-half of dystocias in a cow-calf operation occur in first calf heifers. Second calf heifers have about one-fourth the dystocias, and the remainder of the cow herd about one-fourth (Bellows). For this reason, it is wise to breed first calf heifers to calve before the remainder of the herd. They can then be given special attention at calving time, and they are also more apt to get pregnant the following year.

In work done in Montana, Nebraska, and Colorado, most severe dystocias in heifers occurred in those with abnormally small pelvic openings, but many of these heifers could not be identified without pelvic measurements. In the future, some reduction of dystocia may be accomplished by selection of replacement heifers or cows for cross-breeding on the basis of pelvic measurements (Table X).

Table X
Association Between Area of Pelvic Opening and Calving Difficulty in Three-Year-Old Heifers

Pelvic Area (Sq. Cm.)	200-219	220-239	240-259	260-279	Over 279
Number of Heifers	18	69	121	82	16
Percentages of Calving Difficulty					
No Difficulty	44	75	87	92	100
Slightly Difficult	31	11	10	8	0
Difficult, Calf Puller Needed	12	14	4	0	0
Extremely Difficult	12	0	0	0	0

Wiltbank

Bellows determined that 72 percent of calves that died at birth were normal; 28 percent had abnormalities that accounted for their death. He concluded that most of the normal calves that die at birth can be saved if help is present at calving time. It is difficult to supply help over a 90- or 120-day calving period, so it should be shortened to 50 days by shortening the breeding period so the cattle can be watched more closely at this critical time.

There is a tendency for otherwise knowledgeable cattlemen to make mistakes in handling of dystocias. Some attempt to correct those they are unqualified to correct; others are unwilling to intervene in even the most simple of dystocias. Neither of these courses is wise. There should be a mutually beneficial and helpful relationship between the cattleman and veterinarian in this regard. The trained cattleman should be able to recognize early the dystocias requiring professional help, and he should not delay the call when it is needed. Other dystocias can be reduced without professional help. In fact, the time required to get help may sometimes jeopardize the life of the fetus with certain dystocias. For this reason, guidelines need to be established for the cattleman who wishes to reduce his own dystocias -- guidelines both for commitment to correction and also for desisting from attempts to correct unresponsive dystocias. These guidelines follow.

There are three stages to normal labor. The first stage begins when the uterus starts contracting and ends when the cervix is dilated and fetal parts enter the birth canal. During this stage, the cow will try to isolate herself, but no visible signs of labor are present. Duration of stage 1 is 2 to 6 hours, or sometimes longer in heifers.

Second stage labor (fetal expulsion) begins when the fetal parts enter the birth canal and stimulate the abdominal press. The bovine fetus will usually live for eight to ten hours but is expelled within four hours after second stage labor begins if labor progresses normally. The water sac of fetal membranes and fluids usually appears at the vulva after the cow has been in second stage labor for an hour or two. Delivery should be completed within two hours after the water sac appears. Only by having a continuous calving watch or at most allowing three to four hours between observation periods can second stage labor be accurately defined in calving cows.

Intervention (examination) should be practiced under the following conditions: (1) If the cow has labored two or three hours without making progress; or (2) if the water sac is observed and delivery is not complete two hours later. It is important to have a dystocia watch during calving time so these signs can be observed and early intervention practiced if necessary.

Too early intervention should be avoided. Traction should be applied judiciously until the vulva and vagina are dilated. Too hasty extraction may result in tearing of the cervix or birth canal and result in death of the dam. The life of the fetus is usually not in danger unless dystocia has been prolonged; the few minutes spent in encouraging the vulva to dilate by slow and gentle traction are well spent.

Once intervention is started, the cattleman should limit the time he works on a dystocia. He should apply no more traction than can be applied by two or three men. Professional help should be obtained if progress has not been made after working one-half hour. In many instances, special equipment and techniques are required to deliver the fetus, and these can be supplied best by the veterinarian.

The third stage begins after the calf is delivered and ends when the fetal membranes are delivered. It should be complete by eight hours after delivery of the calf. Fetal membranes retained longer than 24 hours may require professional help; the cow should be observed carefully for signs of sickness.

Maternity facilities should be well bedded and sanitized between cows. The rear of the cow should be cleaned thoroughly with soap and water then disinfected with a solution such as teat dip chemical or Chlorox. The obstetrician should be immaculate, disinfecting his arms and equipment thoroughly then wearing disinfected shoulder length plastic or obstetrical gloves when possible. These precautions are necessary to prevent reproductive failure at a later time.

Obstetrical chains are preferred to rope when traction is required because they can be more easily sanitized. Also, handles are available which attach anywhere along the chains and make traction easier to apply. Nylon web obstetrical straps are available. These must be sanitized very carefully between calvings or infectious organisms may be spread through their use. After boiling, the chains are allowed to drain and wrapped in clean paper and cloth towels until the next usage. The equipment can also be sanitized by cleaning, wrapping, and placing in a pressure cooker and sterilizing, but the chains may rust with this method. Cotton clothesline rope or similar sanitary material can be used if discarded between cows. Otherwise, the rope becomes saturated with fluids and bacteria grow in them causing infection when they are re-used in other cows.

If manipulation of the fetus is the best method for delivery, adequate lubrication is essential. Obstetrical soaps are available or soap solutions can be made by dissolving Ivory soap in hot water. It forms a lubricating gel when cool and can be shaken or poured into a bucket for use. The original supply should be kept uncontaminated.

It is best to pump the lubricating fluid into the birth canal and around the fetus with a stomach pump. The fetus itself must be lubricated well; if the birth canal only is lubricated, the fetus will remain dry and difficult to extract.

Any dystocia should be carefully analyzed before correction is attempted. Effective diagnosis is an important element contributing to success in handling dystocia. One might attempt to extract a fetus coming frontwards with rear legs extended along the belly into the birth canal and pull the fetus into a position in which it were impossible to either extract it further or repel it back into the uterus, seriously limiting options for reducing the dystocia. Errors in diagnosis are also made at times when twins are presented

simultaneously. Torsion (rotation) of the uterus can mimic a fetus in upside down position. Attempts to rotate the fetus without rotating the uterus are futile. Professional help should be obtained when such gross abnormalities of position are encountered. These examples illustrate the necessity for correct diagnosis or the determination of the correct presentation, position and posture of the fetus before manipulations are attempted.

Presentation

The fetus can be presented either frontwards, backwards, or crossways to the pelvic opening.

Position

The fetus can be right side up, upside down, or with its back to the right or left wall of the birth canal of the cow.

Posture

The fetus may have the head retained along either side, along the back, or between the front legs. If it is coming frontwards, one or both forelimbs may be retained with either the knee or the shoulder flexed. Fetuses in backward presentation may have one or both rear legs flexed at the hock or hip. The latter is called "breech" dystocia.

Any combination of presentation, position and posture may occur.

The normal presentation is anterior. The fetus can be extracted successfully in posterior presentation, but there is some danger to it.

The normal position is right side up, and the fetus should not be extracted in any but this position. Some cattlemen have been successful in extracting an upside down fetus, but the chance of damaging or killing the dam and fetus is increased greatly, so it should not be attempted.

Correction of dystocia caused by oversize fetus (shoulder lock) involves two principles. First, the fetal head should have traction applied to it. If this is not done, the head is impacted against the sacrum and the dorsal commissure of the vulva. This compresses the neck somewhat and increases the size of the shoulder girth because the shoulders are spread, increasing difficulty of delivery. Second, traction on the legs should be unilateral but alternated between the forelimbs. The legs are thus "walked" out and the shoulders allowed to pass through the bony pelvic opening one at a time. If one leg comes into the birth canal but the other is difficult or impossible to get in, cesarean section should be done immediately. It should take no more than 15 minutes to determine the necessity of cesarean section. If cesarean section is not done, the oversize fetus may sometimes "hiplock" when the rear quarters reach the pelvic inlet. Proper traction will help prevent this problem by keeping the hips high when they go through the pelvic inlet, taking advantage of the widest

horizontal diameter of the opening. As the forelimbs come through the vulva, traction should be ever more in a ventral direction until nearly parallel with the rear legs of the cow.

Hiplock can often be corrected in a cow lying down by repelling the fetus a short distance, then applying traction to the front legs in a direction up over the upper rear leg of the cow toward her flank. (All hiplocked calves should be repelled before corrective manipulations are attempted.) This rotates the calf and also makes the curvature of one side greater than the opposite, applying additional force to the hip on the side with the greatest curvature. The effect is similar to traction on one leg. When this method is used, an extractive force can be applied by passing a 60-inch chain around the body of the fetus, pulling to the rear and downward with this chain as the front end of the calf is pulled up over the rear leg of the cow.

Hiplock can also be corrected by repelling the fetus and rotating it 45°. Rotation is then maintained during extraction by applying traction to one forelimb while using the other as a lever to apply a continuous rotational force. The position of the fetal pelvis must be determined by more or less constant palpation during extraction to make certain rotation is maintained. This technique works because the vertical diameter of the pelvis is greater than the horizontal diameter.

There are several important considerations when delivering a fetus in posterior presentation:

1. The umbilicus is cramped between the fetus and the pelvis early in the process of delivery. Circulation of blood is impeded, and the fetus will succumb rapidly unless delivered without delay. For this reason, chains should be attached above the hock so they will not require repositioning during the extraction process. This is especially important if a fetal extractor is used.
2. All fetuses in posterior presentation in the cow are emergencies. This presentation should be suspected when legs are presented upside down. They will usually be born dead unless assistance is given once the hips of the calf are through the vulva.
3. Make certain lubrication is adequate. Extraction is against the growth of the hair, making delivery more difficult. Lubricate the fetus, not the birth canal only.

Delivery sometimes can be accomplished by alternating traction on the rear legs. The fetus can also be rotated one-eighth of a turn to take advantage of the greatest diameter of the cow's pelvic inlet. If the fetus is difficult to get started, a cesarean section might be necessary and should not be delayed.

The ewe can sometimes deliver a fetus with one forelimb retained while swine and small animals often do. In contrast, cows and mares are seldom able to accomplish such a delivery, and obstetrical intervention is usually necessary. The forelimb is retained in flexed shoulder

or flexed carpal posture. To correct retained foreleg posture, the following manipulations may be performed:

1. Convert to flexed carpus posture by traction on the upper foreleg.
2. Apply traction on the hoof in a posterior direction. Keep the hoof guarded as much as possible to prevent damage to the uterus. In some instances, the knee needs to be repelled before the foot is manipulated into the birth canal.
3. When the hoof becomes impacted from lack of space, it can often be delivered by applying a rope to the fetlock region. Traction on the rope and repulsion on the carpus will usually deliver the leg. The entire fetus must sometimes be repelled a little distance into the uterus to make room for manipulation of the foot and leg.
4. If the forelimbs are not extended as they come into the pelvic inlet, the partly flexed elbows may lock on the brim of the pelvis and cause "elbow lock" dystocia. Repulsion on the fetal trunk and traction on the limbs will usually relieve this dystocia.
5. One or both forelimbs may become crossed over the nape of the neck as they come into the birth canal resulting in the "foot nape" posture dystocia. Uncomplicated cases are usually not difficult to correct; however, the forelimbs may be forced through the top of the birth canal and make a tear between the rectum and vagina. In some instances, the fetus cannot be repelled enough to free the limbs which have been driven through the vagina, and fetotomy or surgery is required to relieve the dystocia.

The rear limbs can be retained with hocks flexed or extended when the fetus is coming backwards. In the latter case, second stage labor may not be observed and cattlemen may not see the cow in labor until several days pass. Such dystocias may be difficult to relieve. In uncomplicated cases, the "flexed hock manipulation" can be used to extend the legs after which delivery is usually uncomplicated. Stepwise instructions follow:

1. Convert the flexed hip to a flexed hock posture by hand traction beginning high on the leg and working down toward the hock.
2. Apply one hand to the hock and repel it to the front and side, and at the same time, place the other hand over the hoof and move it back, across and out; then repeat on the other leg.
3. A similar manipulation can be performed using a rope snare on the foot. The looped snare is placed over the foot at the fetlock joint and the loop tightened so the hock of the

rope is on the front surface of the foot. The rope is then passed between the claws of the hoof so traction on the snare will cause flexion of the fetlock joint. A hand is used to repel the hock to the front and side while gentle traction is applied to the snare, extending the retained limb into the birth canal.

Head deviations of long duration are among the most difficult of all dystocias to correct. The head may be deviated down (ventral) or to the back (dorsal) but is deviated most commonly to the side (lateral) of the fetus. It can be associated with rotation of the neck which is often impacted into the pelvic inlet. It may be complicated by fixation of the neck vertebrae or "wry neck", requiring fetotomy or cesarean section for correction. A forelimb is often retained in association with the deviated head. Strict adherence to the thirty minute time limit is important with this dystocia to prevent damage to the cow and allow for successful cesarean section if it is required.

Opposing forces are usually required, one repelling the fetus, the other converting the head deviation to normal. For example, traction can be applied to the head with a head or jaw snare while the hand repels the brisket of the fetus to make room for the head to come around. Excess traction on the jaw snare should be avoided. Failure to follow this guideline will result in a fractured jaw. If the cow can be kept standing, the head can sometimes be delivered into the birth canal by traction with the hand alone without repulsion of the trunk.

The head should be kept upright (poll dorsal) during this manipulation if possible. This may be difficult if a head or jaw snare is used because the head cannot be controlled as well as with hand manipulation. If adequate repulsion is obtained on the fetal trunk, the head can be brought into the birth canal upside down, then rotated upright. The teeth are sharp and can perforate the uterus if not carefully guarded.

Vertex posture occurs when the bridge of the nose is impacted against the pubis causing the poll to be presented. Repulsion on the trunk usually makes sufficient room to correct the dystocia. In this dystocia, the fetus is often dead; a living fetus usually moves enough to prevent this type of entrapment of the head.

When abnormal presentations or positions are encountered, professional help is often required. For instance, a fetus which is upside down may be that way because the uterus is rotated or because the fetus is rotated.

Most dystocias due to monster fetuses require cesarean section even though the fetus is small. Ankylosis and deformity prevent delivery through the birth canal. Professional help is usually required for these dystocias.

Once delivered, the calf can be stimulated to breathe by rubbing it briskly, tickling its nostrils with a straw or slapping it with the

flat hand. The mucus should be cleared from its mouth and throat by hand or aspirator. The calf should be placed with head lower than body where it cannot aspirate sawdust or dirt once breathing is regular, and the calf and cow left alone together. Some calves must be removed from their pen if the dam is wild to prevent being trampled and killed. If weather is cold or inclement, the calf should be protected by heat lamp or placed in a warm area.

Artificial respiration can be given to a calf by placing a short section of 1/2" garden hose in one nostril. The mouth and nostrils are then hand clamped so air can enter and leave the calf only through the hose. The person applying respiration then blows into the hose then allows expiration of air. This should be repeated at five to seven second intervals until the calf begins to breathe or its heart stops beating.

Commercial oxygen aspirator-respirators are available. These can be used to both aspirate mucus from the mouth and throat and to give oxygen to calves that require it. Pure oxygen should not be given over extended periods of time because it causes changes in the lung that cause death of the calf (hyalinization).

The cow and calf should be moved to clean pasture as soon as possible after dystocia. Concentrations of calves in a barnyard area may lead to scours. To help prevent scours, the calf should receive colostrum by two hours after birth. Colostrum can be obtained by milking the cow or from sources such as dairys. In the latter instance the colostrum is obtained and stored frozen until it is needed, then warmed to body temperature before usage.