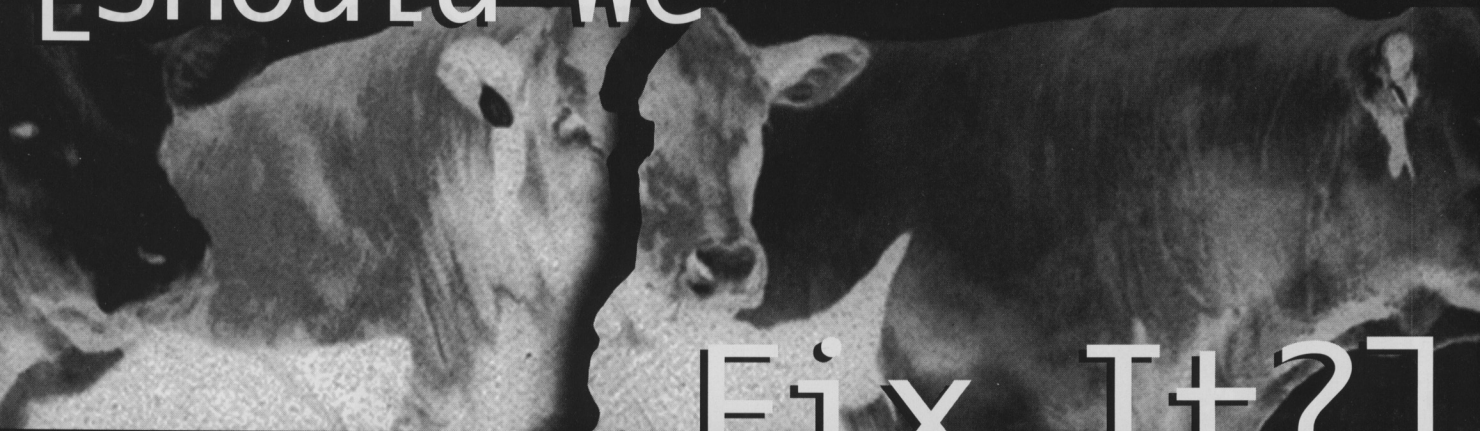


# [Should We



# Fix It?]

## IF IT'S BROKEN

by Dr. Lana Kaiser

### SHOULD I FIX IT?

### HOW TO DEAL WITH BROKEN LEGS IN CATTLE.

**W**hen we think about broken limbs, we don't usually envision cows on crutches! We think about people on crutches, kids with arms in casts, or we might remember a horse being shot after breaking a leg on the track.

Although you're not alone if you don't think about fixing broken legs in cattle, there are times when it makes both medical and financial sense. As a producer, you should know when.

Cattle have several advantages over other species when it comes to our ability to treat their broken legs. There are few racing cows, and most cattle are not (considered) athletes. Bovines are generally content to lay around and chew their cud. Because of these attributes, it is not difficult to preserve function, and lying around makes it easier for bones to heal. Many cows are quite tractable, making it unlikely they would use their cast as a deadly weapon. In addition, cattle unlike horses, do not usually suffer serious complications from redistributing their weight from 4 to 3 limbs. And finally, cattle make fabulous callus (the new bone that bridges and repairs the break). Fabulous callus is the glue that connects the pieces of bovine bone.

How do you decide if your animal is a reasonable candidate for fracture repair? The following are the primary considerations:

**AGE** – (Just like people) young animals heal better and faster than adults.

**SIZE** – Smaller animals do better than larger animals. Part of this is age related, smaller animals tend to be younger, but perhaps more important is weight. Bigger animals have more weight to distribute, larger muscles that will pull against you (and the cast) when you are trying

to set the fracture and finally, bigger animals have a harder time just getting around with one leg in a cast.

**VALUE OF THE ANIMAL** – This is a decision best made by you, the producer. How much is this animal worth to you and your operation. Is she pregnant with a valuable calf? Is she a donor who produces consistently fabulous calves? Is he an old bull you'd like to collect one more time? Is he the ET calf of your dreams? Your kids favorite 4-H cow? Or is she a mediocre cow that should have been culled last year but you didn't have time?

**FUNCTION** – The physical demands placed on a donor cow are much different than the physical activity expected of a herd sire or a pasture bred cow. While the donor could spend her life in a small paddock with no competition for food, the bull must be able to travel some distance and mount cows and the cow must be able to withstand mounting. Thus, while a limp and some difficulty in traveling might be acceptable in a donor cow, it would likely result in poor performance in both the bull and the pasture bred cow.

**TEMPERAMENT** – Because a cow with a cast is packing a (potential) lethal weapon, temperament is of the utmost importance not only for the safety of the human, but also the safety of the animal. Casts today are made of either plaster or fiberglass, often reinforced with metal. Because it is necessary to immobilize the joints both above and below the fracture, the end result may be a large, heavy, cumbersome object. Although cattle tolerate casts much better than many species, do not expect the terror of the range to become your neighbors Holstein, just because she has a cast.

**CONCURRENT DISEASE** – Though not usually a problem in beef cattle, valuable purebred animals with health problems may occasionally be encountered. Cattle with chronic infectious disease (Johne's Disease, Bovine Viral Diarrhea) or cancer (lymphoma) are not good candidates for fracture repair. Not only because their lifespan is limited by the concurrent disease, but also because the disease may actually be, in part, responsible for the fracture or poor healing.

**ABILITY AND DESIRE TO PROVIDE ADEQUATE INDIVIDUAL CARE** – You can't put a cast on a cow, turn her out with the herd, bring her back in 6 months, and expect her to be perfect, she won't be! She will need a large stall or small paddock, or both! She will need to be examined daily and pampered a little. Remember, broken bones hurt, she may benefit from some aspirin for a while after the injury. The cast will need to be changed at least once, and maybe more, depending on the type of fracture and the age of the animal. X-rays may need to be repeated. You may have to truck her to and from the clinic a number of times. Don't say "Go ahead and fix her doc", if you don't intend to do it right. There is both a financial and time commitment when treating fractures in cattle – you need to make them both.

**TYPE OF FRACTURE** – Bones can be broken in a variety of ways. As in many other things, simple is better! A simple break across a bone is much more likely to heal nicely than a shattered bone. The more loose pieces, the more likely that one of them will end up causing trouble. Open

fractures (where the bone goes through the skin) are bad news and almost always end up infected.

**LOCATION OF FRACTURE** – Getting bones to heal involves having them properly aligned and not moving. To do this with a cast, the joints both above and below the fracture must be immobilized. Therefore, in the forelimb, fractures of the radius & ulna (bones between the elbow and wrist in humans) and below can be treated. In the rear, fractures of the tibia (between the knee and ankle) and below can be treated. Thus, in cattle, fractures of the humerus (between the shoulder and elbow) and the femur (between the hip and the knee) generally cannot be treated in an economically and medically satisfactory way.

**COST** – There are three basic ways to treat broken bones: rest, casts, and hardware. Rest is cheap but it doesn't usually work very well.

Casts are relatively inexpensive, simple to apply, require no expensive equipment, and generally work well. Plaster casts are cheaper than fiberglass, but they are also heavier and don't hold up as well. Hardware consists of stainless steel plates and screws and rods. The procedure to use hardware is called "open

reduction and internal fixation". This means that the animal undergoes surgery, the bone is exposed, and then set using a variety of plates, screws, rods etc. These pieces of hardware were devised to treat fractures in humans, thus they are very expensive, require major surgery, and they were designed to bear human, not bovine, weight. There are only rare cases where hardware is an option for fracture management in cattle.

Costs of treating fractures will vary greatly across the country and depend upon the number of x-rays needed, the number of cast changes, use of anesthesia etc. At Michigan State a fiberglass cast for a cow is between \$80 and \$120. X-rays would be about \$40. If the animal required one cast change (2 casts total) and 2 sets of x-rays, the minimum cost would be about \$300. This does not include medications, charges for emergency care, anesthesia, hospitalization etc, which may or may not be necessary.

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Clearly, this would not be cost effective for a \$400 animal, but may be a very good investment for a \$4000 animal. But remember, these costs do not include your time.

How do you decide if your animal is a candidate for fracture repair? Lets look at a few real cases.

Fred is a one day old ET Hereford bull calf with a problem - his mother, a less than tractable recipient, stepped on his forelimb. Now Fred has a broken leg. Should we fix it? What does Fred having going for him? He's young and small. He currently has no job in life other than to nurse and grow. His ultimate goal in life is to be a bull, so this fracture needs to be repaired to maintain function. He is a Hereford and quite mellow. Fred is a resident of Michigan State's Purebred Beef Farm, thus, not only is he less than a mile from the Veterinary Teaching Hospital, Fred can receive individual care both in the clinic and on the farm. The frac-

## IT MIGHT BE A GOOD IDEA TO FIX THIS ONE!

- Valuable cow, seedstock or donor
- Cow pregnant with valuable calf
- Favorite cow
- Calm, good natured animal
- Young animal
- Simple fracture
- Individual care is available
- Follow up care is available

## THINK CAREFULLY BEFORE YOU FIX THIS ONE!

- Adult, heavily muscled
- No facilities to treat individual animals
- No desire to treat individual animals

## DON'T DO IT!

- Crazy cow
- Open fracture (bone through skin)
- Fracture above the carpus in the front
- Fracture above the hock in the back
- Animal with other problems or disease

ture is of the type and location that can be easily managed. He will need a cast from the hoof to the carpus, and likely one or 2 cast changes.

Fred is an ideal candidate for treating his broken leg.

So, on New Years eve Fred is heavily sedated, the fracture set (bones aligned by applying traction) and the leg is placed in a cast. Fred does very well, the fracture heals nicely and no one can tell by looking that Fred ever broke his leg. Fred is purchased

for a tidy sum of money (by producers who were aware of his broken leg), and is currently doing all the things expected of a bull! Fred is a success story!

That was an easy one, lets look at another case. Apricot is a 16-month-old purebred Maine-Anjou heifer, pregnant to a national champion bull.

Great things are expected from this breeding. One morning Apricot shows up at feeding time fracture lame on the right front leg. Should we fix Apricot? What does Apricot have going for her? Well, in bovine terms she is relatively young and small, although not as small or as young as Fred. Not only is she is pregnant to a Champion bull, but also she is the herdsman's favorite, a bottle baby whose mother died at calving. Her current job is to carry this

pregnancy to term, but as a cow she will be pasture exposed to the bull after AI, so she will need to maintain function of the leg. She has a wonderful temperament and the farm has the ability and desire to provide individual care. Unlike Fred, Apricot's bones (radius and ulna) were shattered, but the fracture is in a place that can be treated with a cast/splint combination. Would you treat Apricot?

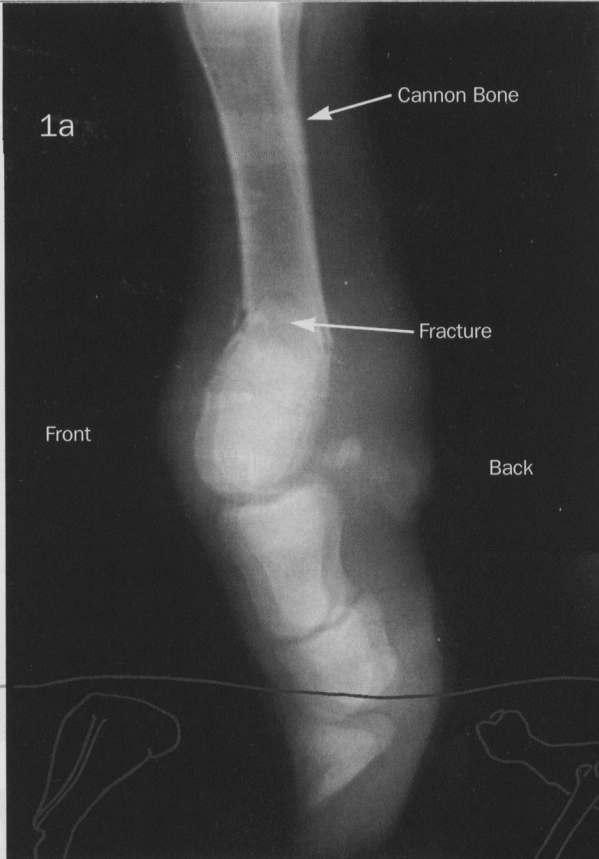
Apricot is a pretty good candidate for fracture repair, particularly in the short term: it is quite likely that she can carry this pregnancy to term. She is treated with a metal splint - cast combination. Her care requires several cast changes and series of x-rays. Ten weeks after the accident the cast is removed.

She walks with a noticeable limp, and there is some question of nerve damage;

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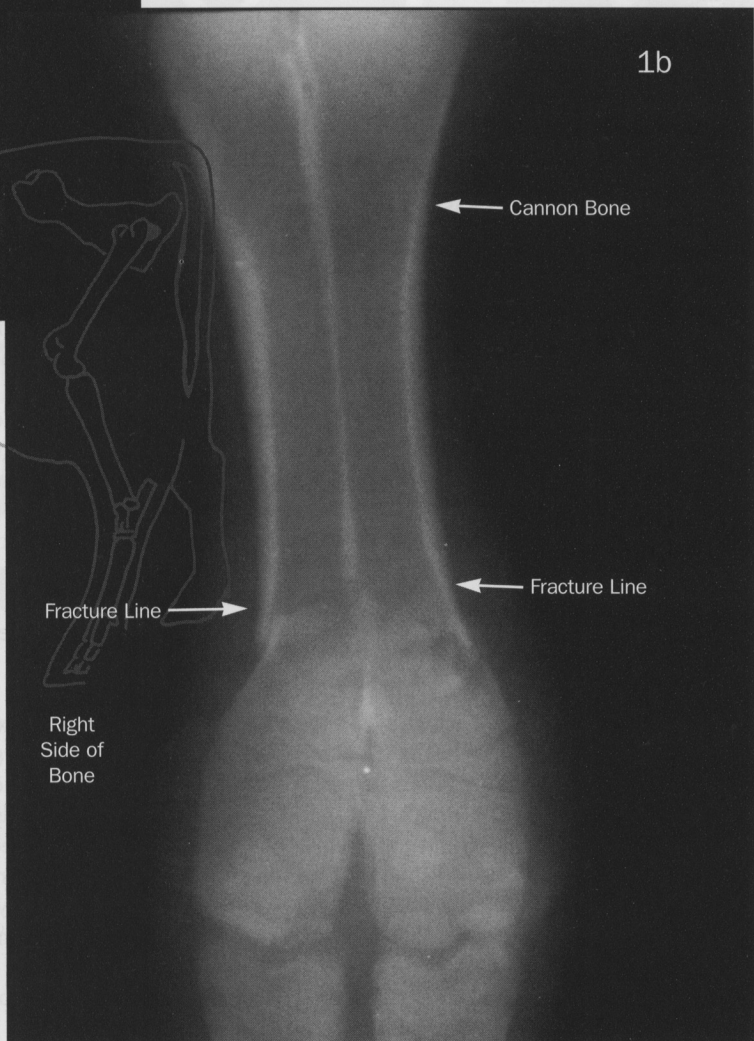
she will never be a racing cow. After the birth of her calf she is returned to the herd. But she just can't compete - she's small (800 lbs), she's lame, she's nursing, and she is the last one to the feedbunk - Apricot can't make it in a big herd.

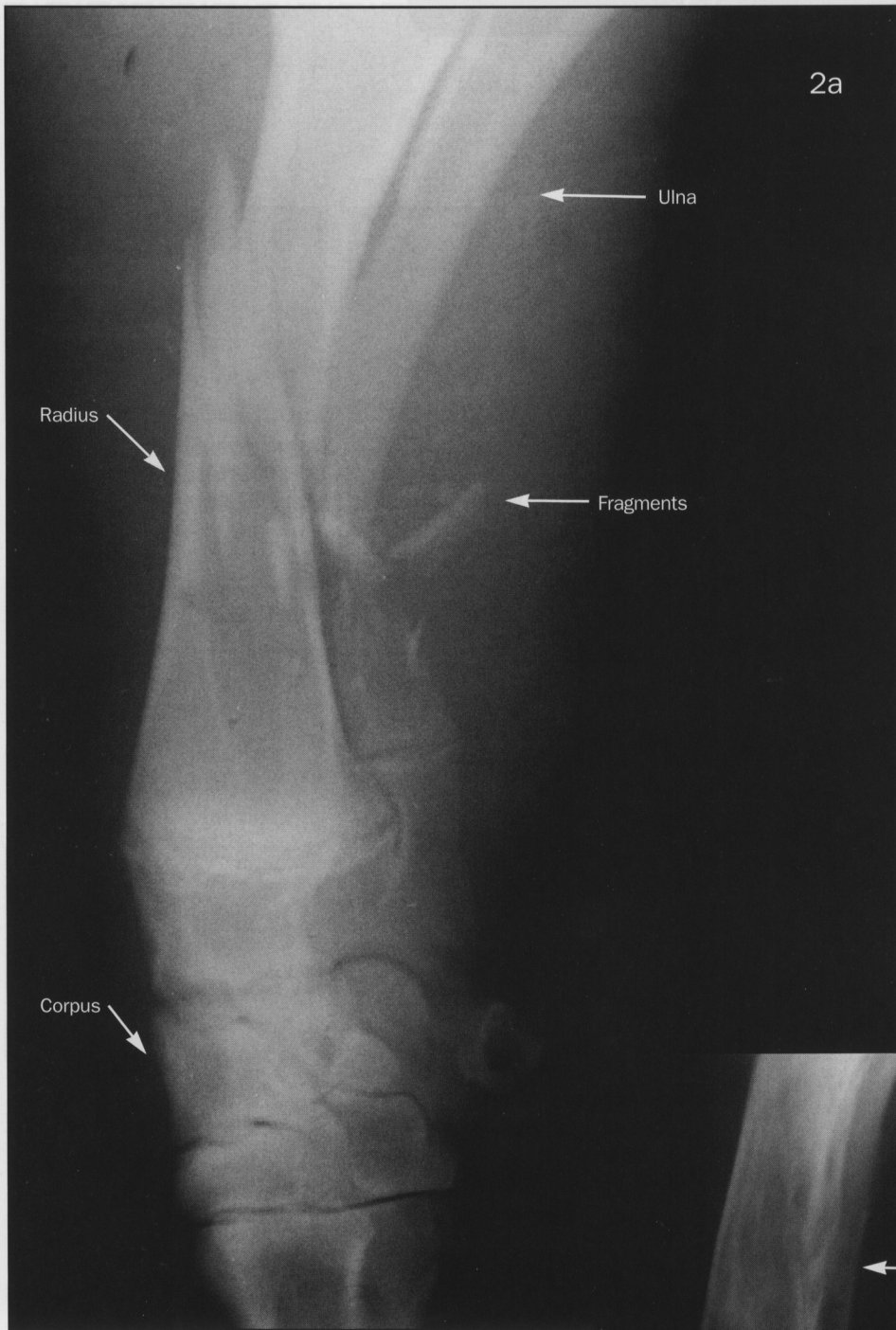
On August eighth the calf is weaned and Apricot is purchased by the veterinarian who cared for her. She is the boss cow on a small Maine-Anjou purebred farm in Michi-



**Figure 1.**

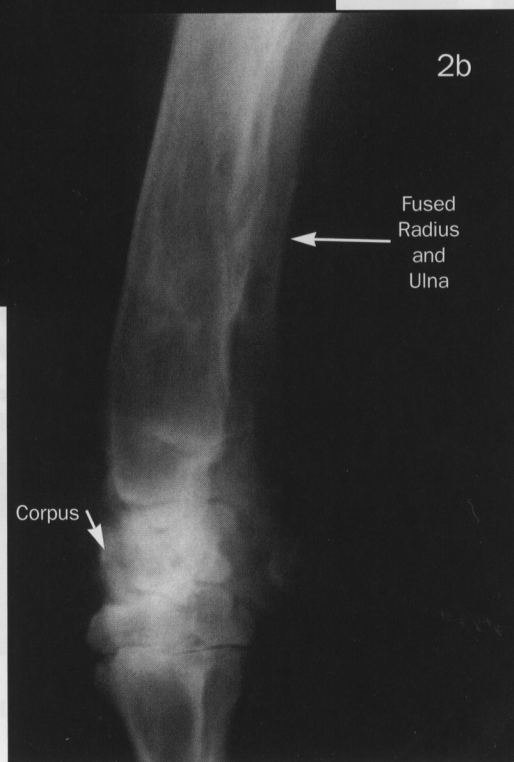
Figure 1 shows a lateral (from the side) radiograph (x-ray) of Fred's forelimb several hours after he was stepped on by his mother. It shows a fracture of the distal cannon bone. You can see breaks in the cortex (outside layer) of the bone. If you look at the picture of the cow skeleton you can see that these bones aren't lined up right. Figure 1b is a different view (front to back) of the same bones, showing the same fracture. This view is a little more subtle, but you can see on the right side where the cortex is broken.





**Figure 2.**

Figure 2a shows a lateral x-ray of Apricot's right foreleg after she was transported to the clinic. This x-ray was taken in August of 1994. Both the radius and ulna were broken, some might say shattered. Notice the big spikes of bone on the front side of the leg and the multiple pieces and fragments of bone. Figure 2b is an x-ray of Apricot's right foreleg in 1997. Notice that there is complete healing of that monstrous fracture! You can also see that the 2 bones (radius & ulna) that Apricot had before the fracture have fused into one.



gan. She has had a nice heifer calf and both she and the heifer are pregnant. She requires twice yearly therapeutic hoof trimming, but no other specific care. Apricot is in heaven!

One final case, how would you handle this one? Daisy is a 6 year old registered Holstein, milks over 100 lbs per day and is the daughters 4-H cow. Daisy shows up at milking time three legged lame. There appears to be a piece of bone sticking out of her hide. The farmer, who wants everything done for Daisy, calls a trucker to bring her to the University, he doesn't need to call a veterinarian, he knows her leg is broken and he wants it fixed. Three hours later the trucker arrives; 6 hours later Daisy arrives at the clinic. On arrival it is clear that Daisy is in trouble; she can't stand, she can't walk, and a piece of radius is sticking out of her forelimb. The farmer is unhappy that the prognosis for fixing Daisy is so poor and the price to do so so high; besides, he can't put her on antibiotics for the open fracture, because he'd have to dump the milk. He decides to take Daisy home and have her custom slaughtered. Almost 15 hours later Daisy arrives home to die; not the best end to a life devoted to the farmer. It didn't have to be that way. If the farmer knew just a little about fixing broken legs in cattle, he would have known Daisy was in trouble and not subjected her to the 15 hour round trip to nowhere.

The bottom line: Repairing broken legs in cattle can be a wise economic and medical decision. It is important to understand when it might be a viable alternative, but just as important to know when it is a bad medical, financial, and humanitarian decision.

*Dr Kaiser, a Maine breeder and veterinarian, would like to acknowledge Dr. Russ Stickle for help with the x-rays as well as ongoing consultation and advice. Dr Stickle is a cattle breeder and veterinary radiologist in Williamston, MI. Both are faculty members in Large Animal Clinical Sciences, College of Veterinary Medicine, Michigan State University,*