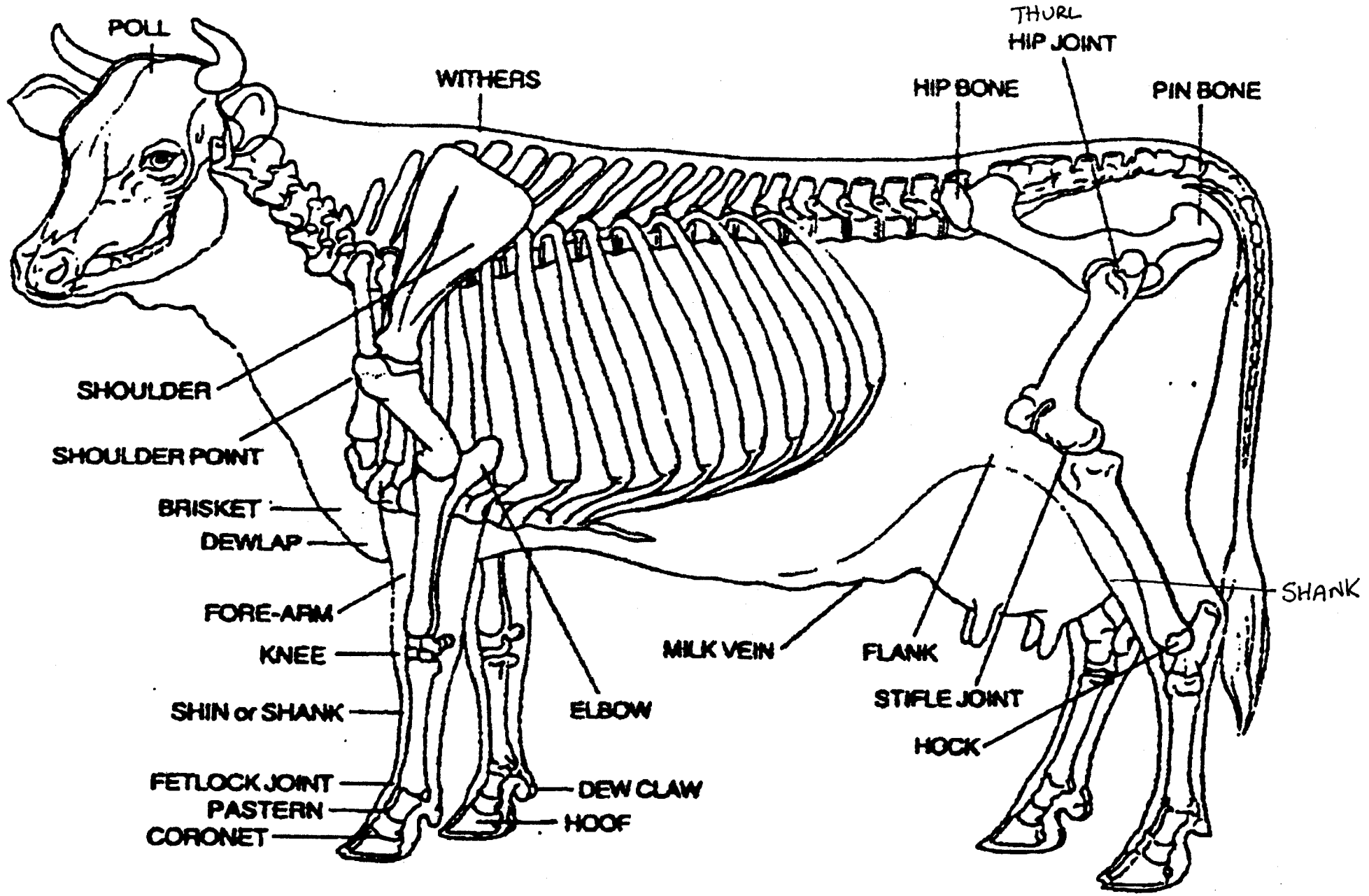
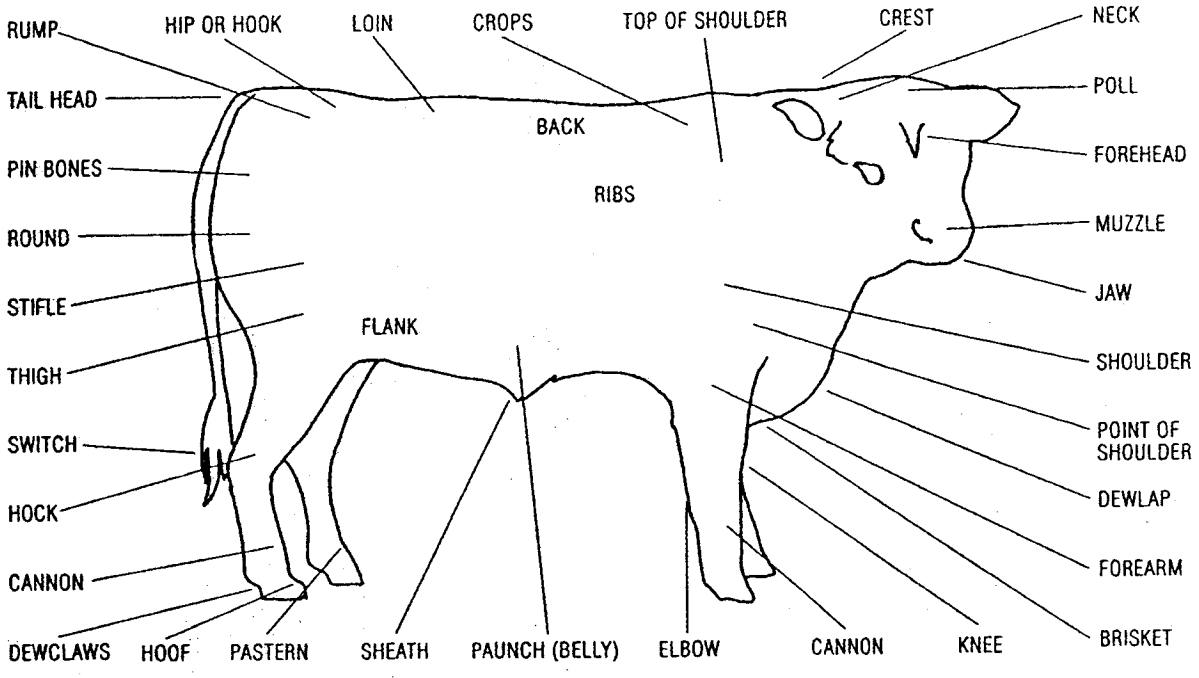

POLL
WITHERS
THURL
HIP JOINT
HIP BONE
PIN BONE
SHOULDER
SHOULDER POINT
BRISKET
DEWLAP
FORE-ARM
KNEE
SHIN or SHANK
FETLOCK JOINT
PASTERN
CORONET
ELBOW
DEW CLAW
HOOF
MILK VEIN
FLANK
STIFLE JOINT
HOCK
SHANK

STRUCTURAL SOUNDNESS

Structural soundness relates to the skeleton. The bone structure of an animal should be as free of flaws or defects as possible.

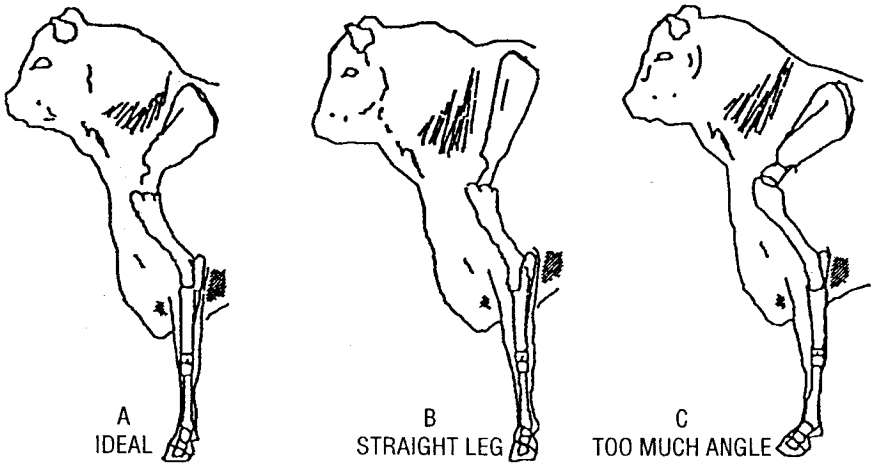
There has been some debate regarding the importance of structural soundness and its effect on profitability. Despite this, the majority of feedlotters agree that it has a significant impact on performance, particularly in cattle fed for more than 100 days. These are usually cattle fed to relatively heavy export weights of more than 500 kg.



FRONT LEGS AND SHOULDERS

An animal's weight should be evenly set on all legs to reduce undue stress on individual joints.

The diagram below illustrates the two major problems encountered in the shoulders and front legs. The straight shouldered beast (B) is more rigid and is prone to damage caused by continual impact on the shoulder and elbow joints. Indicators of straight shoulders are the animal walking with a lower neck and head and also very short, worn front feet. Short stepping is another.

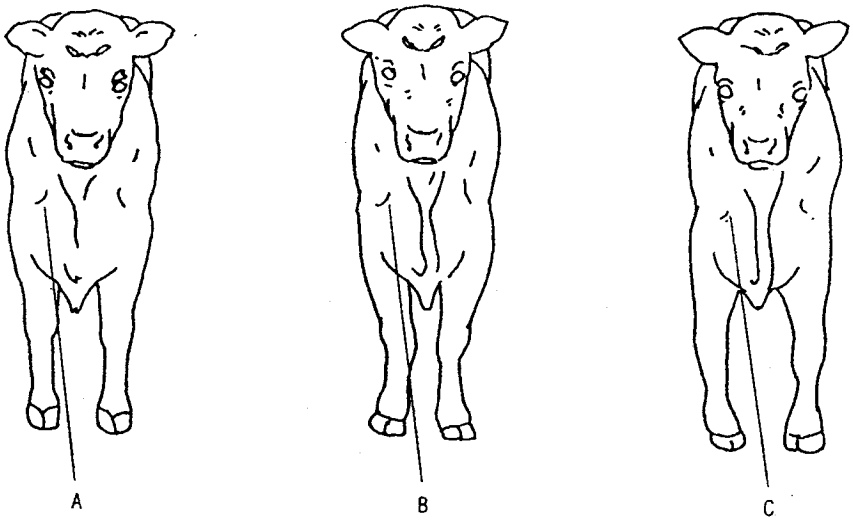


Animals with too much angulation in the shoulder (c) will sit back on the hoof and develop long toes. Damage to the dew claws may occur.

FRONT LEGS AND FEET

Feet should be large and deep at the heel. Sound feet are symmetrical with equal sized and shaped toes.

The first diagram shows the normal front leg and feet structure. Diagrams (b) and (c) illustrate the two most common problems - knock kneed and bow legged. On the normal animal, a vertical line can be drawn from the point of the shoulder to the middle of the claw. The line should pass through the middle of the knee.



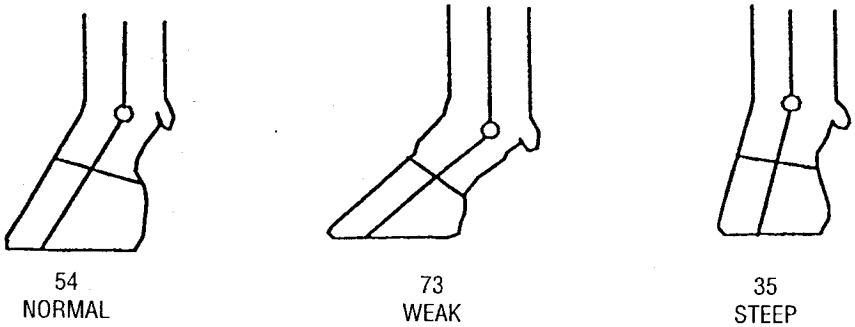
Animals which are knock kneed or bow legged deviate from this line and cause excessive strain on the knee joints.

A "knock kneed" animal may have turned out front feet and overgrown outside claws. The bow legged animal may have turned in front feet, overgrown inside claws and have a narrow stance.

Looking from the side, the pastern angle of front and also hind legs can be examined.

Claw length and shape is a good indicator of problems further up the legs. Short claws generally indicate the animal is too straight in the leg and excessively long claws indicate too much angle, either in the pastern and or hock.

Unevenly worn claws indicate the animal is not distributing weight evenly and this is commonly caused by knees too close or too far apart.

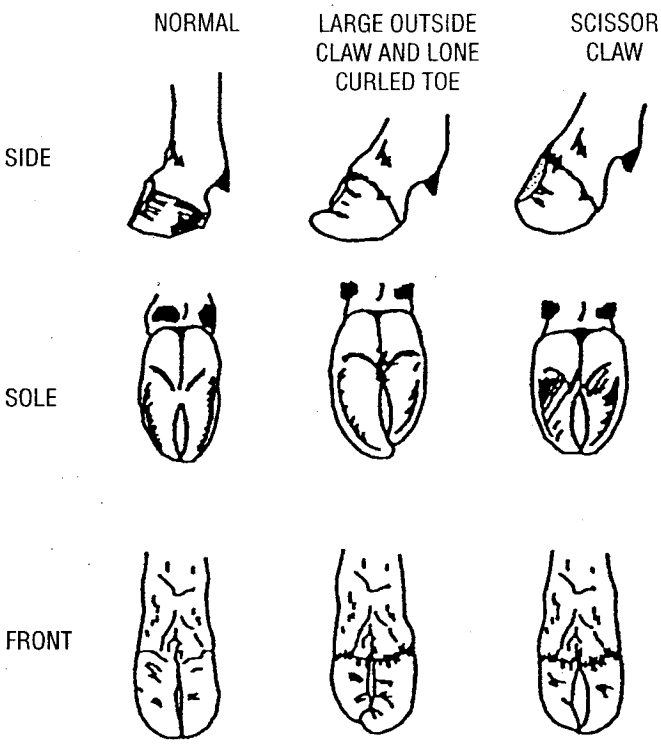


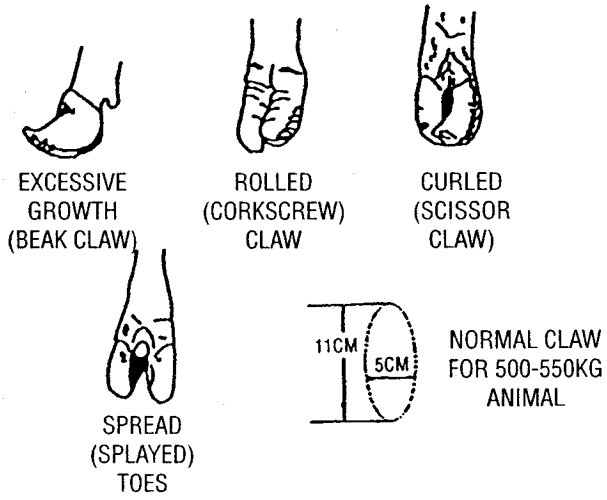
CLAW PROBLEMS

Problems occurring in claw structure are usually beak claw, scissor claw, corkscrew claw and spread toes. Scissor claw is associated with animals wearing the rear of their feet.

Other factors affecting claw growth are soil type, mineral deficiencies, wet seasons, grain feeding and amount of activity. Some are debatable others are widely accepted.

The main message is to be aware of what's normal and remember that abnormalities commonly cause discomfort, lameness and subsequent poor performance.





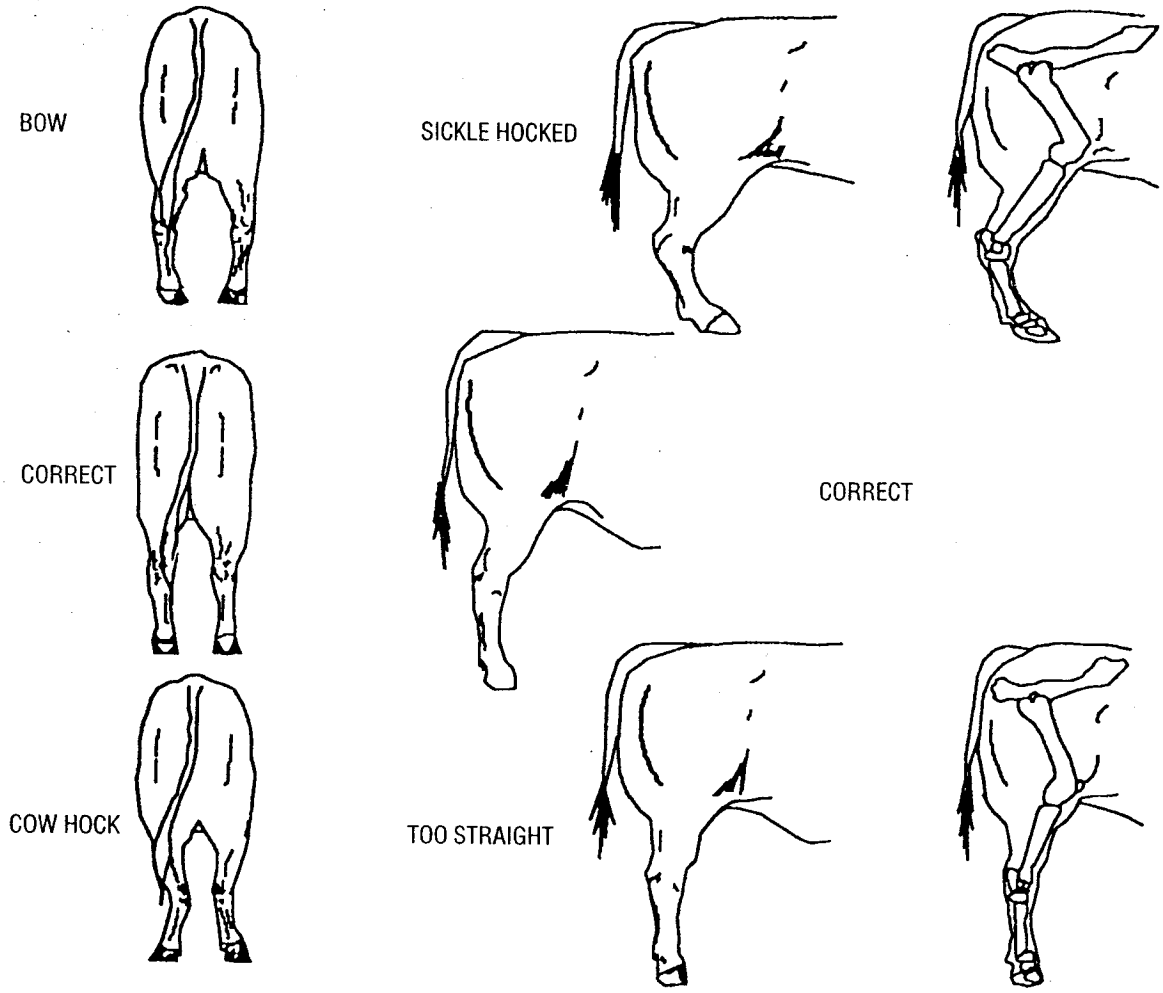
HIND LEGS AND FEET

Commercial research indicates many of the breakdowns in feeder cattle are due to structural faults in hind legs.

Many of the problems occur in the hock, stifle, pastern and hip joints. Incorrect angles in these joints cause the animal to stand incorrectly, causing excessive strain and damage.

The major problems are; post leg, sickle hock, bow leg and cow hock. Many of the obviously apparent feet abnormalities are commonly caused by hidden leg and joint faults.

As mentioned earlier, post legged cattle have reduced shock absorbing ability which causes problems in the stifle and hip joints. Typical indicators are straightness in the hock and pastern joints, short upright hooves and short stepping. The figure below shows the correct stance and common hind leg faults.



WALKING ABILITY

Well balanced, structurally correct cattle should track straight with a long, smooth stride.

"Tracking" refers to the `walking ability' or `walking pattern' of an animal. A structurally correct animal will place it's rear feet in the tracks of it's front feet. Animals that short step are often straight legged in either the front or hind legs causing inflamed joints, arthritis and lameness. Well balanced, structurally correct cattle should track straight with a long, smooth stride.

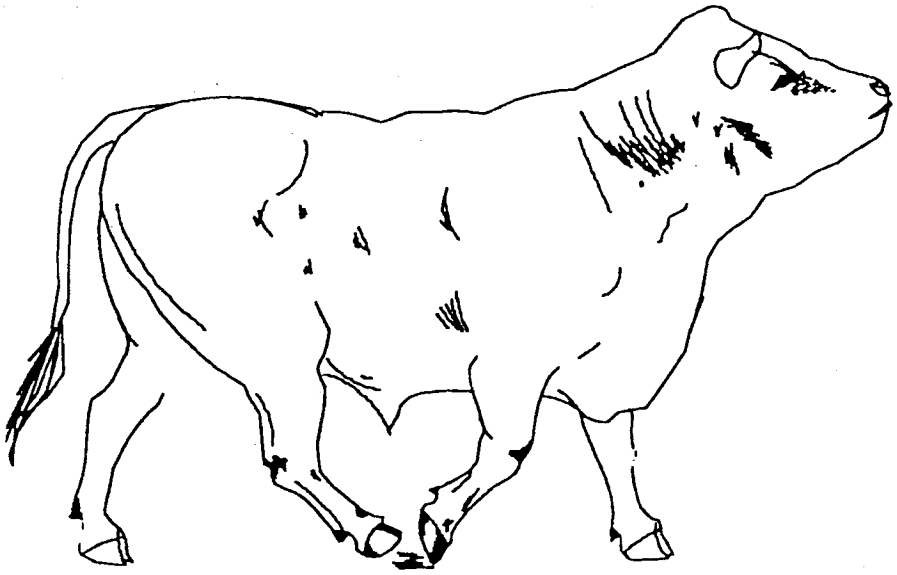
Look for a free moving gait, with the hind feet stepping into the footprints of the front feet. Over or understepping are indications of structural problems, as are uneven footprints from the claws.

Overstepping is a symptom of cattle being sickle hocked. This is generally not as serious as post legged, however can result in breakdowns. Sickle hocked cattle often have long toes and very worn heels. The main area of breakdown is in the hocks.

The other extreme is the problem of cattle with legs camped behind, where the legs extend backwards beyond the point of being post legged.

Examination from directly behind can reveal whether an animal is cow hocked or bow legged. Cow hock cattle have hocks that are too close together, are rotated inwards and have feet that point outwards. Bow legged cattle have the opposite problem. Their hocks are wide apart and their feet point inwards. This condition usually results in more trouble than cow hocked cattle, as excessive pressure is placed on the ligaments of the hock joints.

This information is from the Australian Feedlot Directors produced by ALFA and Agriculture Victoria and sponsored by Elders. Courtesy of Geoff Kroker



THE PELVIS

The pelvis is the major structural bone around which the skeleton is built. It is fused to the spinal column in mature males and attached by strong ligaments in the female. It is the main support structure for the rear legs.

In the female, it forms the channel through which the calf must be expelled and is the structure from which the udder is suspended.

The way in which the pelvis is shaped and set up is therefore very important to the function of the female. There are three angles that should be considered in assessing the ideal pelvis.

See Figure 1 – Sketch of Pelvis.

The angulation between the hip and pin bones is important in opening up the size of the pelvic rim through which the calf must pass. Tilting the pelvis by lowering the pins increases the pelvis area by approximately 1% for every one degree of angle that the pins are lowered, with the optimum angle being approximately 18 to 20 degrees.

See Figures 2 and 3 – Sketches of Pelvis With High Pins and Tilted.

The dairy industry has traditionally looked for the pins being high in the belief that it gave greater support to the rear udder. The trade off has resulted in up to 80% of maiden heifers requiring assistance to calve.

Figure 2.

The angle or "set" of the top of the pins should be between 30 – 45 degrees. This is important, as an angle any less than 30 degrees (flat pins) tends to be associated with the tail head being set too far forward, with the associated and consequential effect of the vulva laying forward and flat instead of vertical. This phenomena results in reduced fertility stemming from the uterus being less able to drain properly after calving and the danger of infection from faeces laying on the vulva and not dropping clear.

Figure 3.

Given good length from hip to pin, the ideal setting of the thurl bone should create a 90 degree angle between the three points i.e. hips, pins and thurls and should be set as close as possible to equidistant between the hip and pin (See figure 4).

The angle itself is important only so much as in order to form the 90 degrees, the thurl must be set low. This is an indication of depth in the pelvis. Set equidistant between hip and pin, the thurl indicates length in the pelvis floor, giving udder attachment more directly above the weight of the udder. It also provides a larger and flatter floor, allowing the contracting uterus to more easily clean post calving.

In order to improve the size of pelvic opening, we must increase width and/or depth. Depth can be indicated by the position of the thurl bone. Width can be gauged from the width of the pins. The width between the upper section of the pins is equivalent to the internal width of the pelvic rim.

Given the seasonal and genetic variations in calf weight and the variations in calf shape, the greatest single factor affecting calving ease is the shape and angulation of the pelvis. A factor which can be assessed visually.

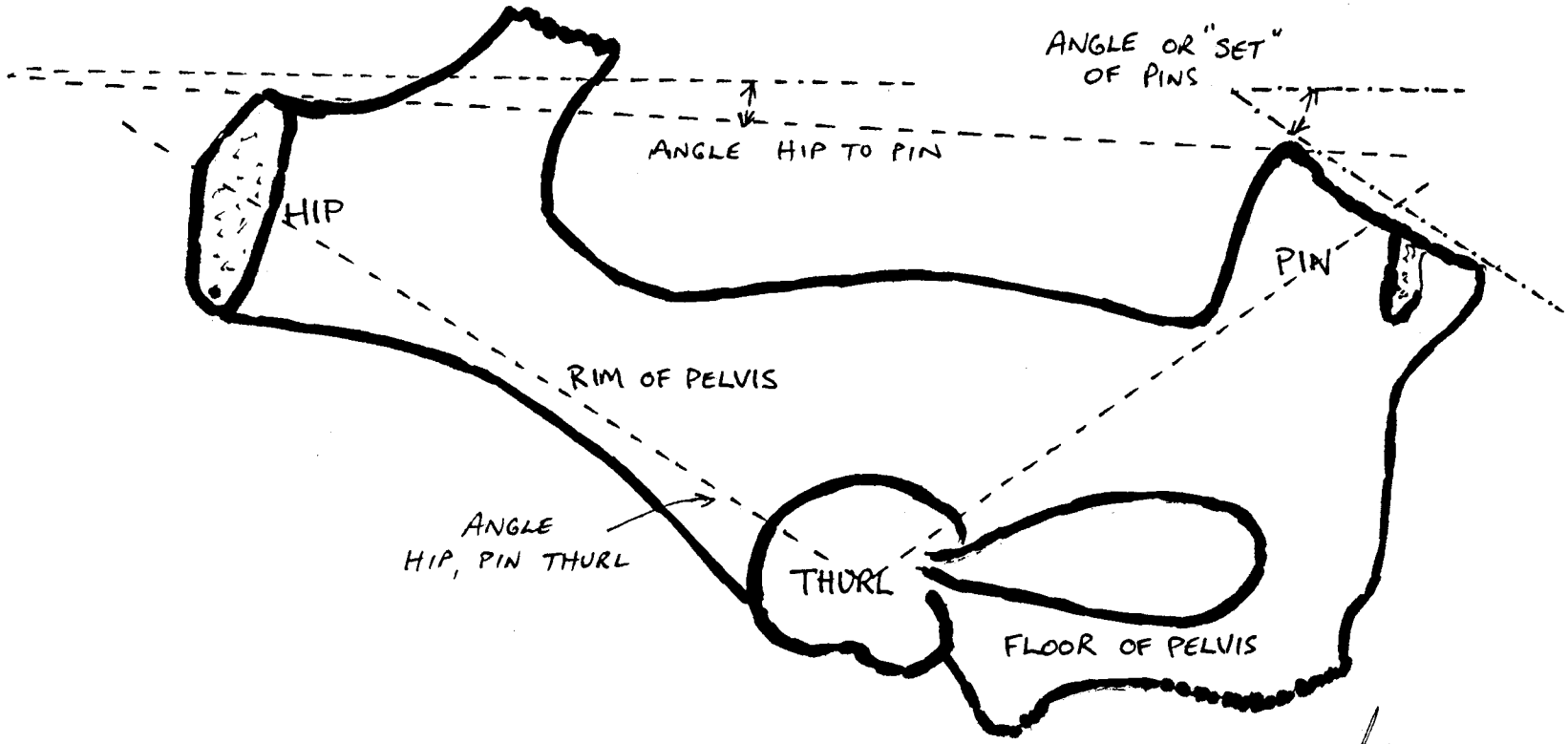

ANGLE OR "SET" OF PINS
ANGLE HIP TO PIN
HIP
PIN
RIM OF PELVIS
ANGLE HIP, PIN THURL
THURL
FLOOR OF PELVIS

FIGURE I

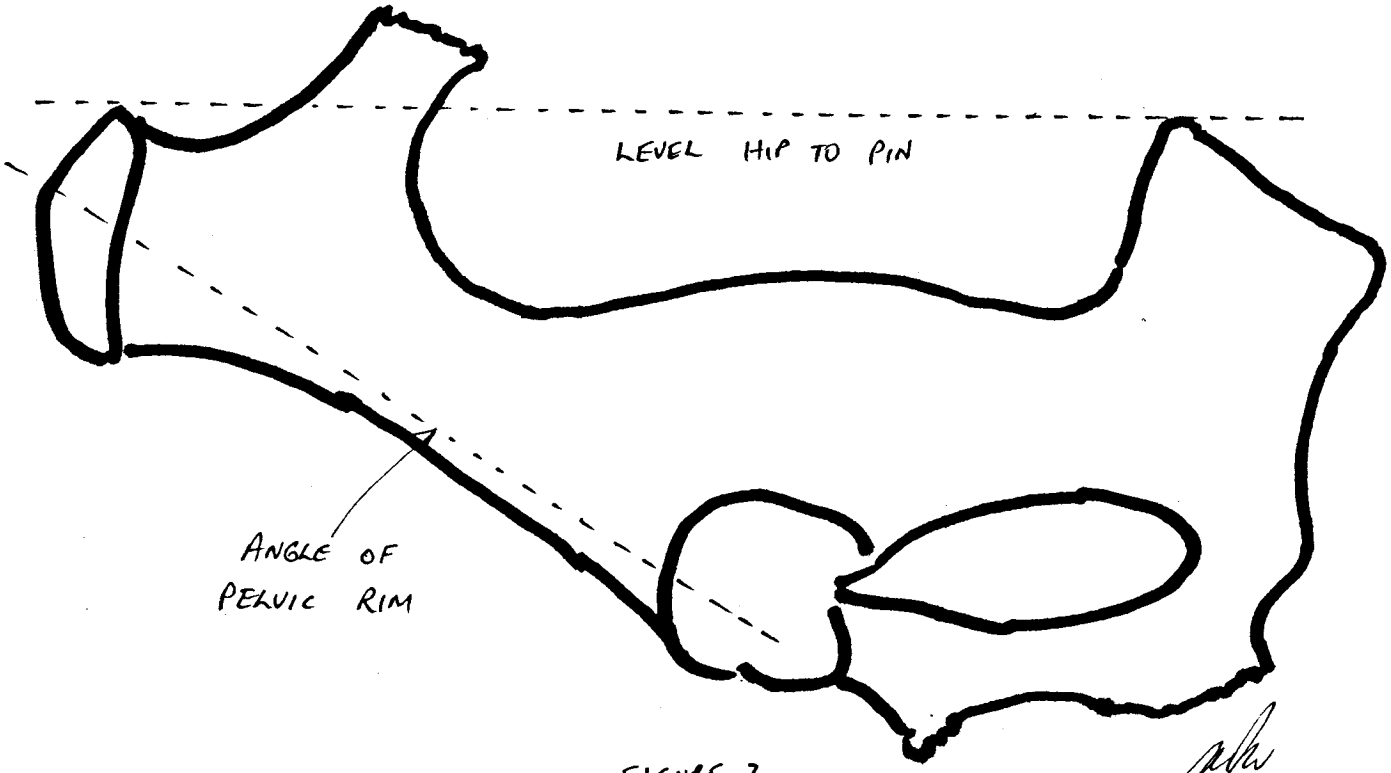


FIGURE 2

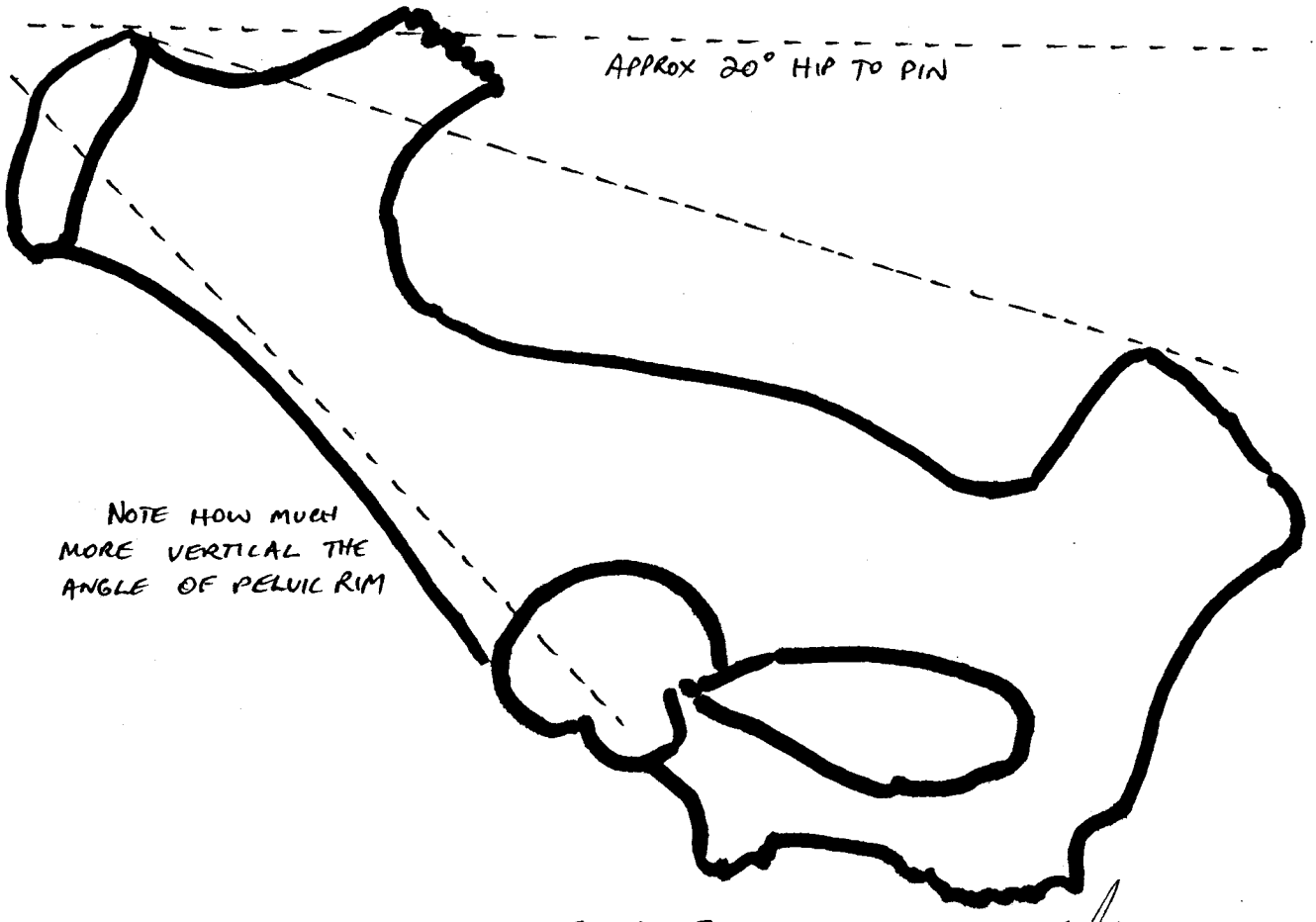
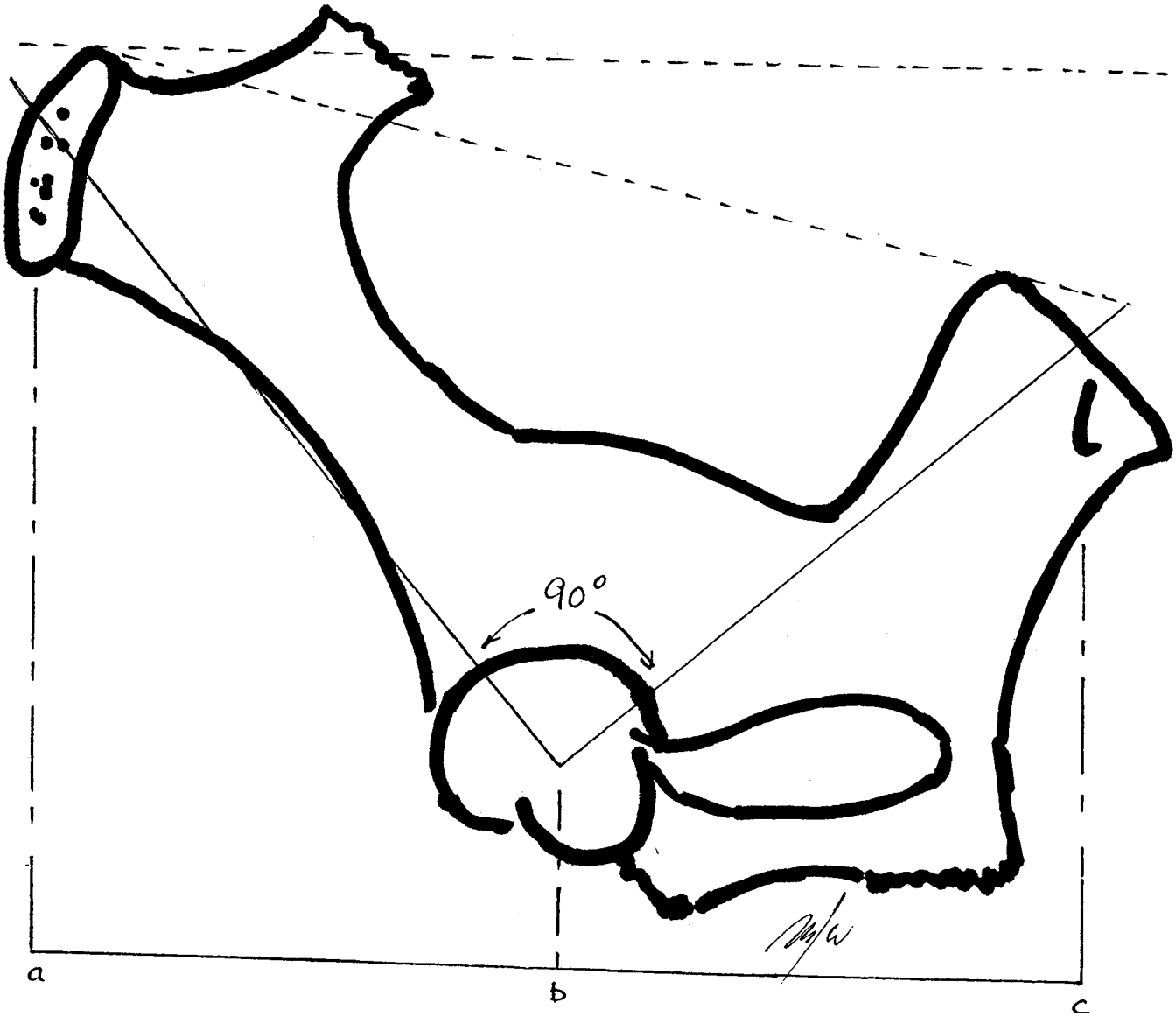


FIGURE 3



Note a to b equals b to c.

FIGURE 4.
THE IDEAL PELVIS

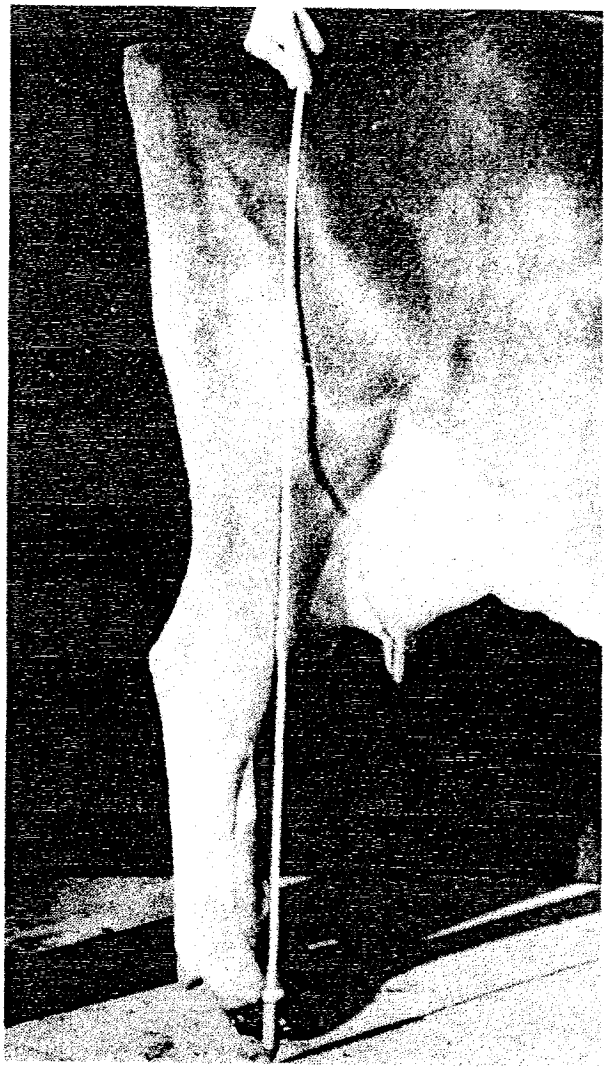


Fig. 98 The plumb-line test, which can be duplicated in practice by an imaginary line, shows that the weak pasterns push the legs back too far. The space between the front of the hock and the plumb line is slight, but there would be none at all if this cow had a strong set of pasterns (a moderate discrimination). (Courtesy American Guernsey Cattle Club, Peterborough, N.H.)

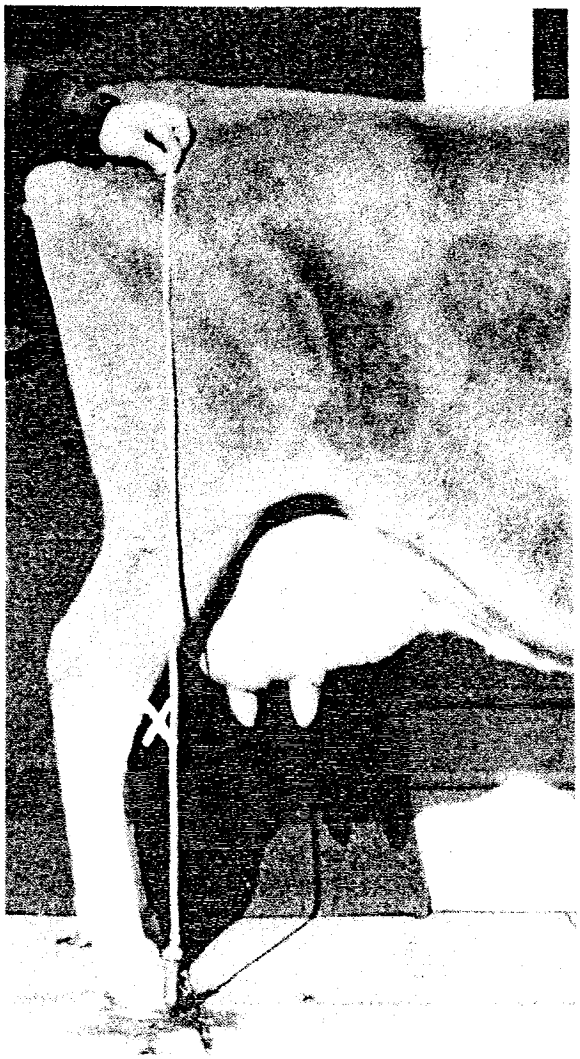


Fig. 99 This cow has ample bone, but her legs are sickle-shaped and hence awkward (a moderate discrimination). (Courtesy American Guernsey Cattle Club, Peterborough, N.H.)

Fig. 95 The strength of pastern and depth of foot in this cow are very good. (Courtesy American Guernsey Cattle Club, Peterborough, N.H.)

Fig. 96 This cow has a shallow foot, with the hock set too far back, which causes her to scuff when she walks and makes her susceptible to foot trouble (a moderate discrimination). (Courtesy American Guernsey Cattle Club, Peterborough, N.H.)

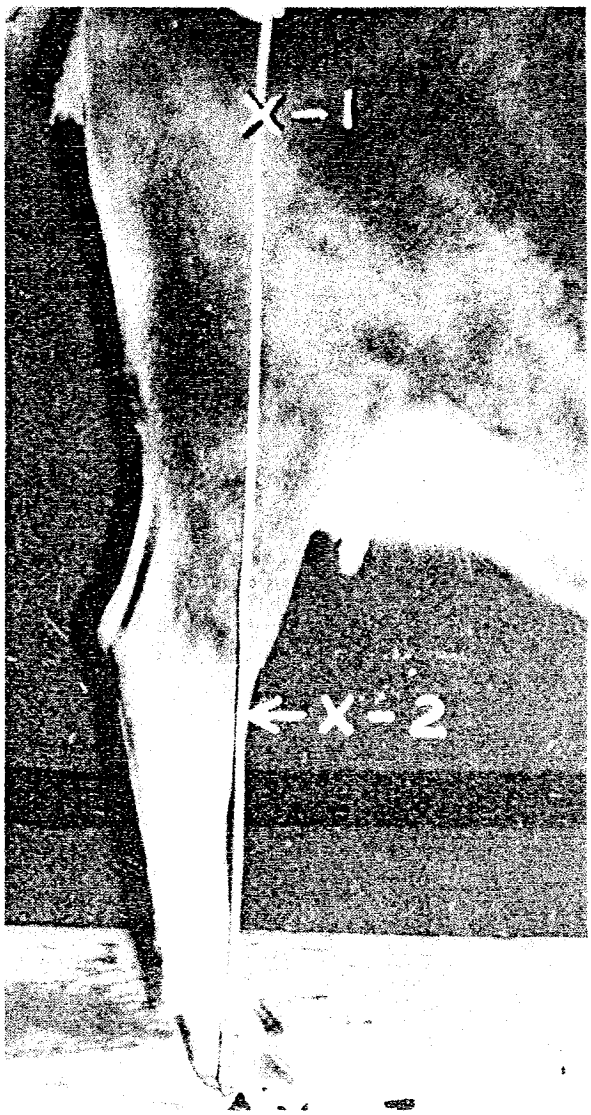


Fig. 97 A fine set of legs with strong pasterns and well-shaped feet. X-1 indicates point of thurl. The plumb line is even with the hock, X-2. The plumb should touch the ground midway between the heel and toe of the hoof. (Courtesy American Guernsey Cattle Club, Peterborough, N.H.)

ASSESSING MUSCLE

There are a number of places on a live animal where it is possible to obtain a visual assessment of the degree of muscle the animal carries, such as butt profile, shank, loin, stifle etc.

However in a carcass the principal guide is the cross sectional area of the eye muscle. This is also the area that is scanned to produce a EMA (eye muscle area in square centimeters) reading on live animals.

It is possible to gauge the EMA on a live animal once you understand some basic principals.

1. The function of a skeletal muscle is to move bone.
2. To do this muscle is attached to bone.
3. Animals have different bone shape and accordingly different muscle shape.

In simplistic terms the eye muscle runs over and is attached to the short ribs of the loin area, over the rib cage adjacent to the spine and tapers off under the shoulder blade.

Eye muscle area is usually measured between the last two ribs. Cross sectional area is basically achieved multiplying length by depth, so that in order to improve EMA the depth of the muscle, or the width of the muscle, or both must be increased.

It follows that the wider the short ribs the wider the muscle will be and the higher the vertical process of the spine the deeper the muscle will be. The more parallel the short ribs the wider the eye muscle will be as it travels over the rib cage.

In assessing a live animal place your index finger on the spine between the last two ribs and gently but firmly draw it towards you. You will feel your finger drop over the edge of the eye muscle. This gives an indication of width. Check how far the short ribs are below the top of the spine to gauge the depth of muscle.

Visually, look for width of loin, degree of taper of loin, height of chine, width of shoulder blade from chine and depth of loin. Corresponding hips should be well below level of spine.

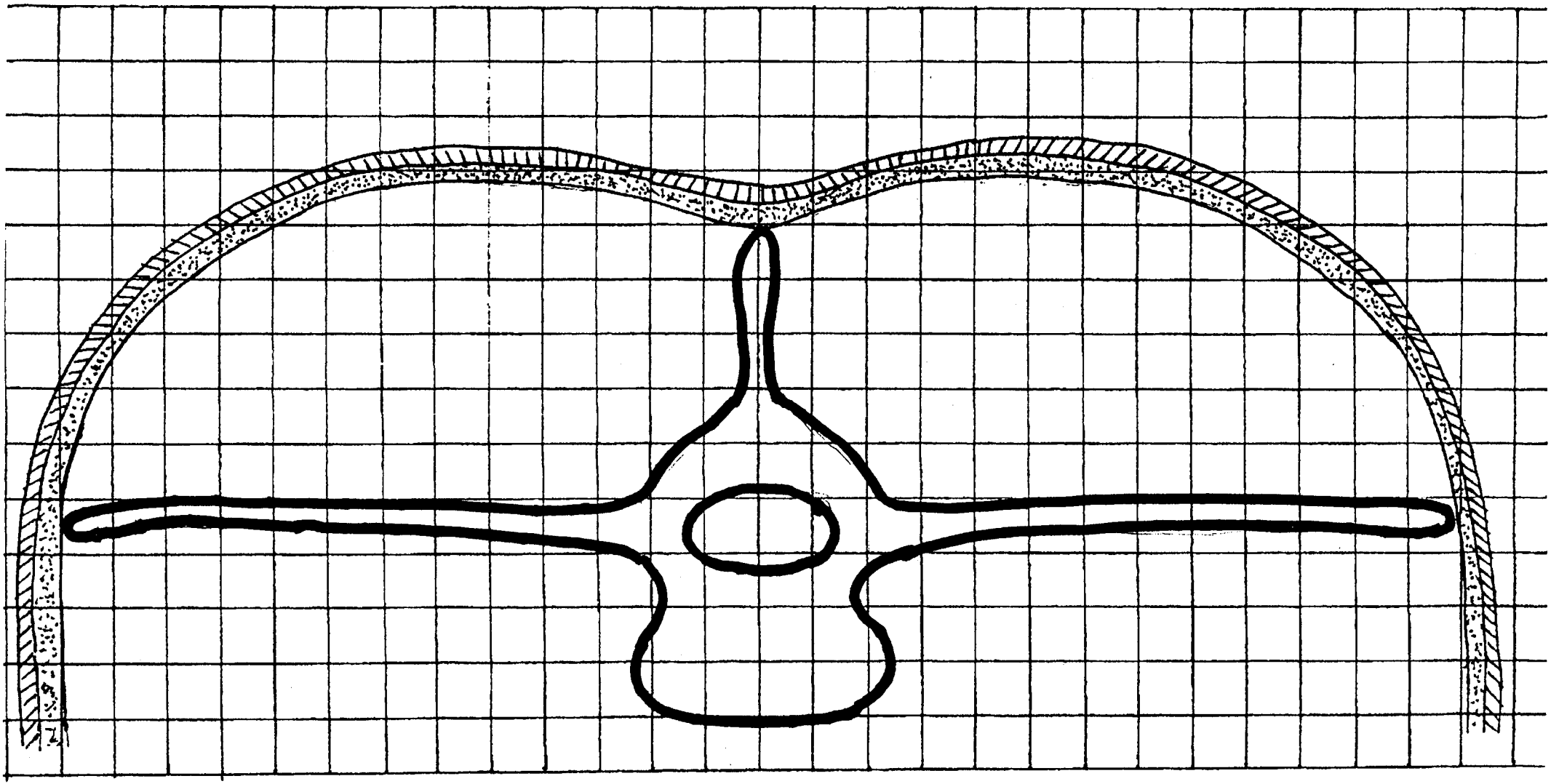
The diagrams of the cross section of the loin illustrate the requirement for both depth of muscle and width of muscle to obtain a high EMA reading and the relationship of muscle with bone.

STEER 'A'

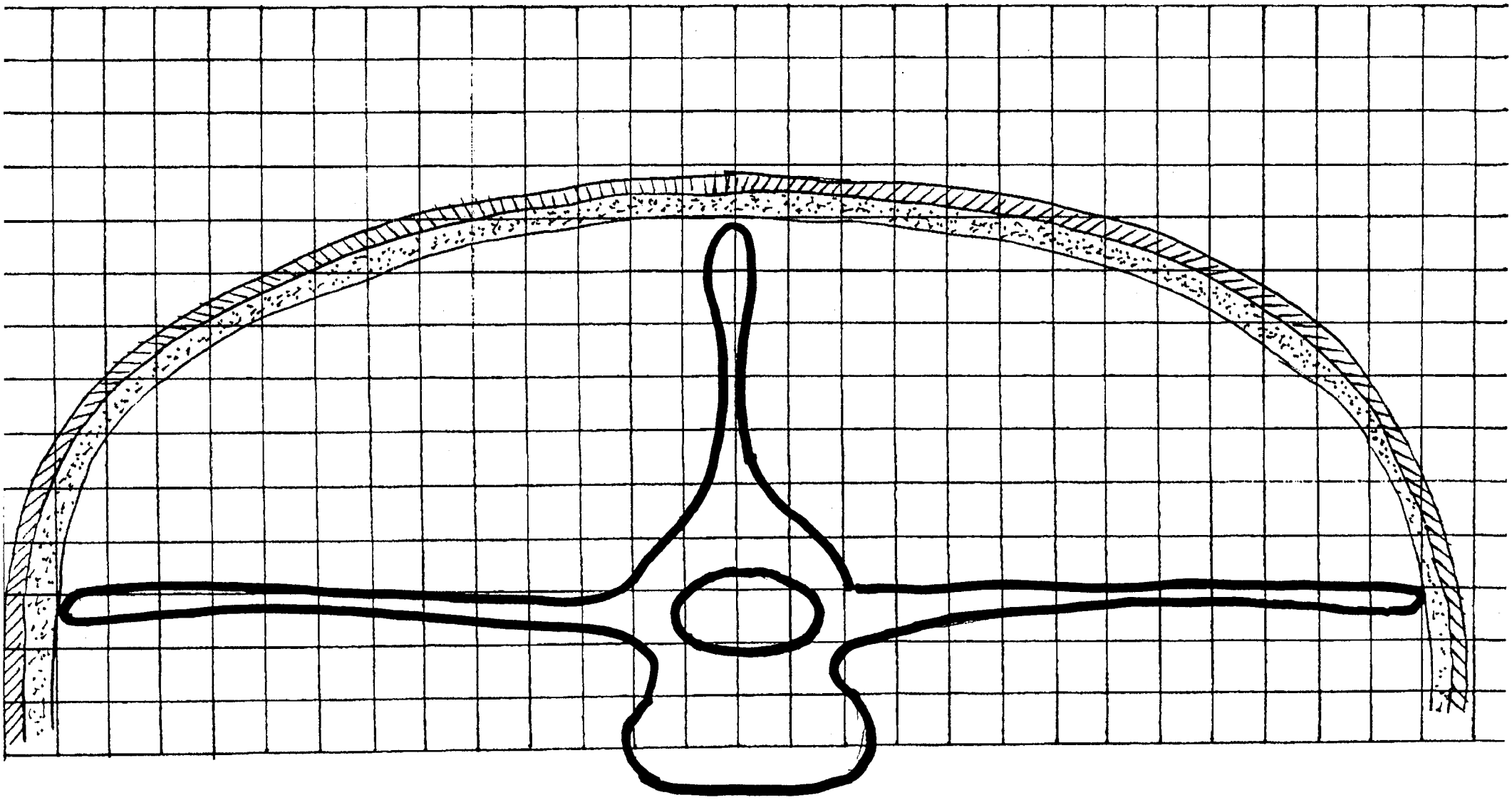
'A' & 'B' MUSCLE TYPE

WITH SHORT VERTICLE PROCESS

LOOKS MUSCLY BUT LACKS MUSCLE AREA

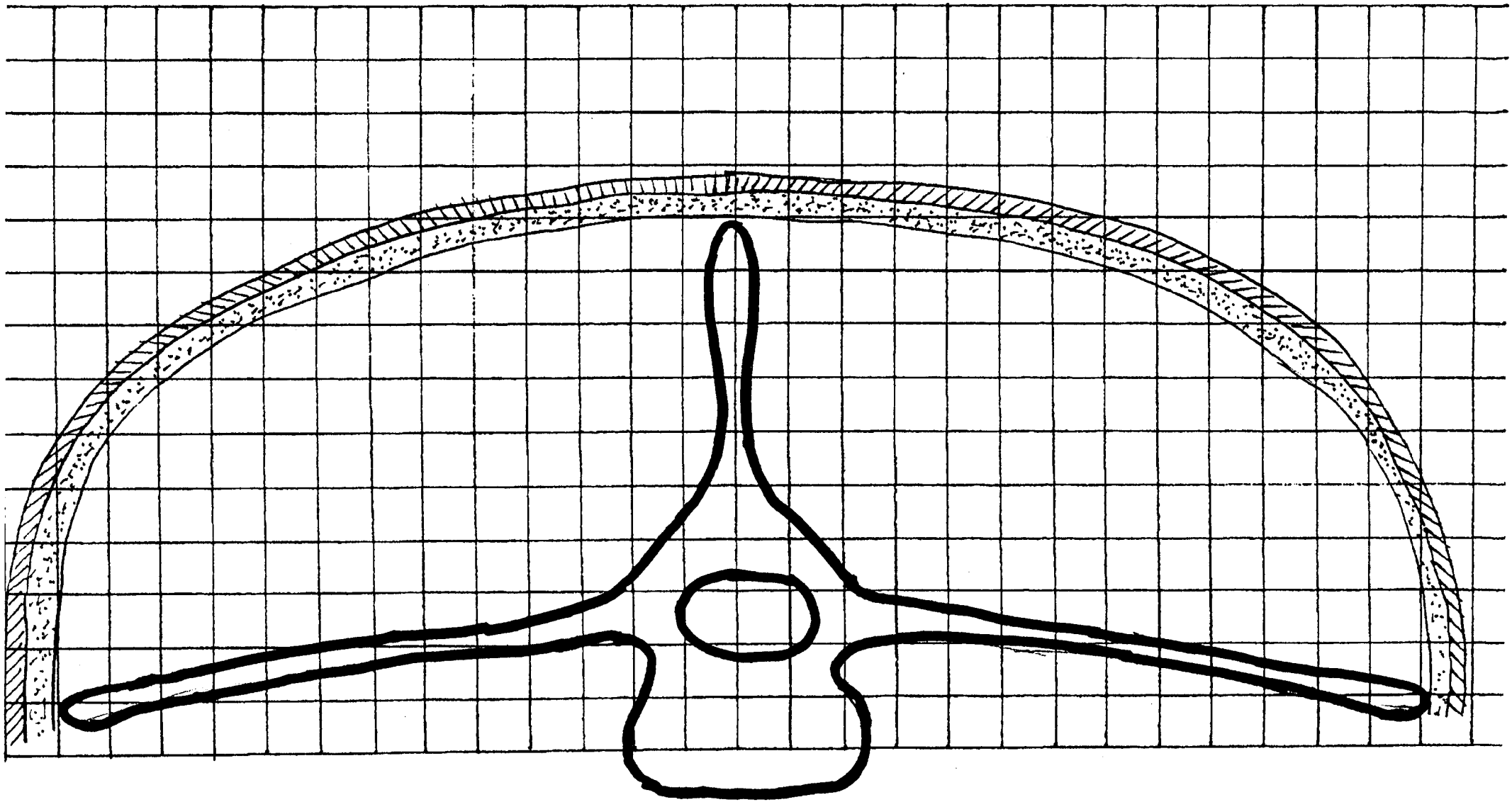


STEER 'B'
HIGH VERTICLE PROCESS
WIDTH OF LOIN
DOES NOT LOOK MUSCLY
BUT HAS EYE MUSCLE AREA

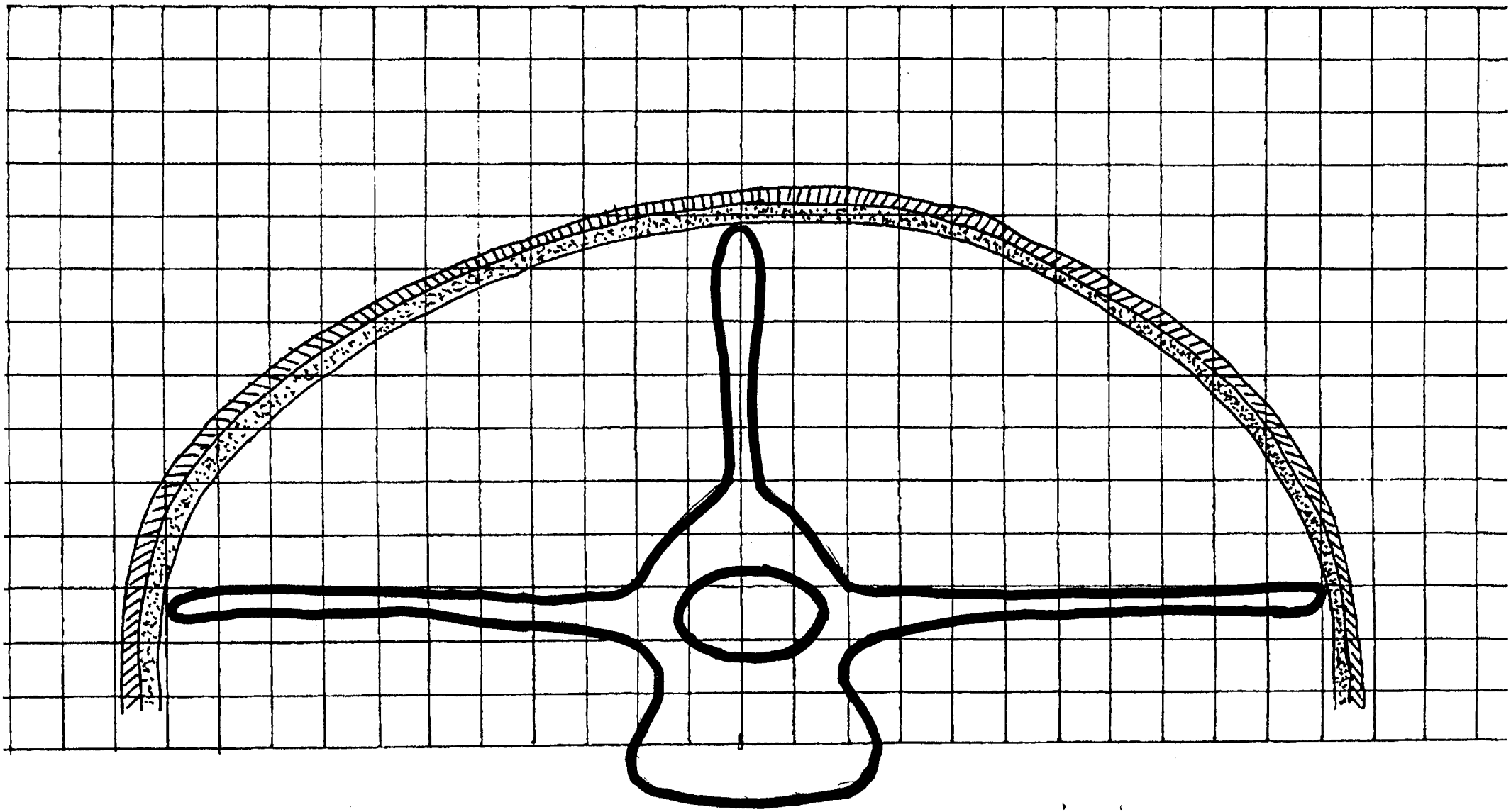


STEER 'C'

ONE TO LOOK FOR:
HIGH PROCESS, WIDTH AND
ALSO SLIGHT ANGLE DOWN OF SHORT RIBS
DOESN'T LOOK BULGY - BUT HAS MUSCLE



STEER 'O'
DOES NOT HAVE IT
LACKS HEIGHT AND WIDTH
'O' MUSCLE TYPE



TESTICLES

The Testicles are one of the most important organs, influencing long term profitability of your breeding herd. Not only are they important for bull fertility, but they can have a significant influence on the fertility of daughters and grand daughters.

Use of a bull with poor testicles can influence fertility of female descendents several generations down the track.

Testicles are closely related to the uterus and ovaries and deficient testicles in a bull can lead to deficient ovaries in the female.

Bull fertility can be described as optimal, tolerable, undesirable and unacceptable.
A bull that gets one cow in a hundred in calf is not sterile, but his fertility certainly would be unacceptable. A bull of optimal fertility should settle 85-90% of cycling cows in the first cycle.

To have optimal fertility a bull should have testicles which hang evenly. Both should resemble a football in shape, be of the same size, and have the same firmness (tone) as a firm orange. The epididymis on each testicle must be the same. They should be well rounded of similar tone to the testicle and be the size of a walnut. Testicles should be correct circumference and length for their age which in a mature bull resembles two drink cans. Any deviation from the above causes decreased fertility.

Size and shape of testicle and epididymis have a genetic basis but bull fertility can be affected by many things such as illness, high temperature, drugs, travel.

A bull which is fertile today may not be fertile tomorrow. Bulls who develop degeneration of the testicles seldom recover their fertility.

Correct testicles can be identified from a young age.

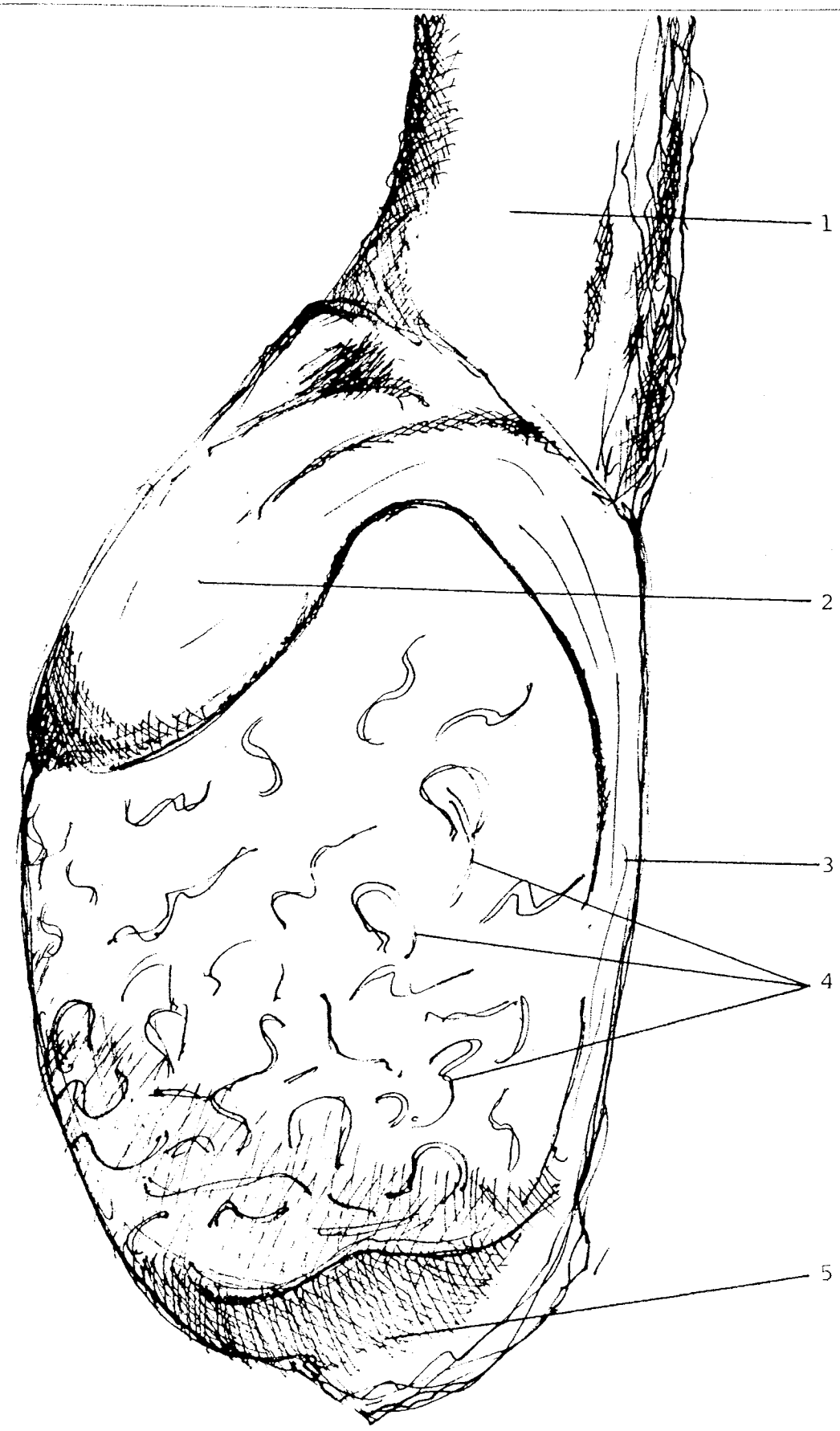


Illustration 1: Sideview of a Testis of a Bull Showing: 1) Spermatic Chord, 2) Head of Epididymis, 3) Body of Epididymis, 4) Arteries, 5) Tail of Epididymis. At maturity, the testis is 4 - 5 inches long and 2 - 2½ inches wide, and weighs about 500 grams.

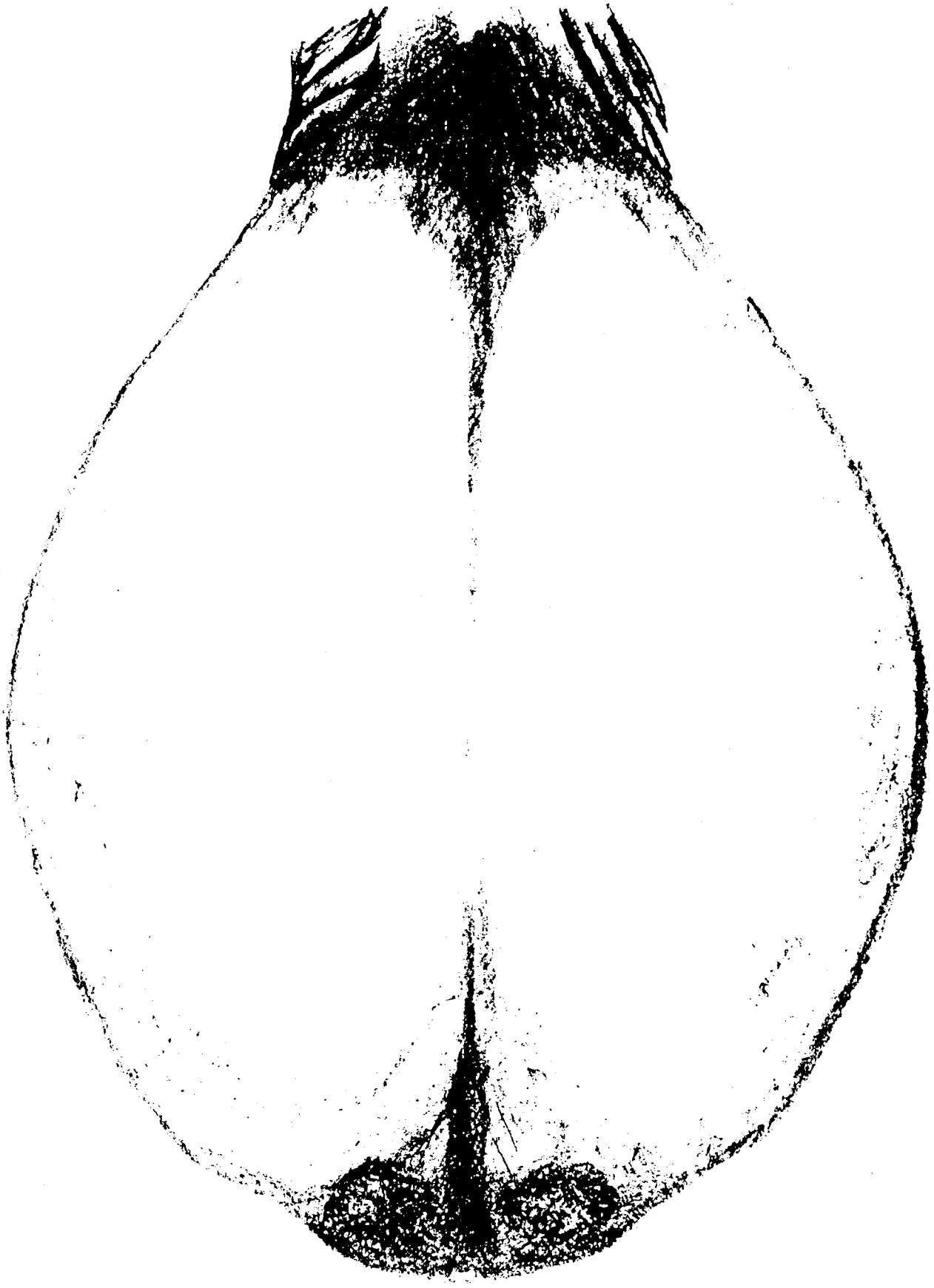


Illustration 5: The Normal Shape and Approximate Actual Size of a set of Testicles of. an "Optimal" Bull.